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l35 and L36	53

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IBM Technical Disclosure Bulletins

Search:

L37

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DATE: Thursday, March 20, 2003 [Printable Copy](#) [Create Case](#)
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result set

DB=USPT,PGPB,JPAB,EPAB,DWPI; PLUR=YES; OP=ADJ

<u>L37</u>	l35 and L36	53	<u>L37</u>
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<u>L32</u>	l30 and L31	4	<u>L32</u>
<u>L31</u>	l5 same l6	7	<u>L31</u>
<u>L30</u>	(l1 or l2 or l3 or l10) adj l4	331317	<u>L30</u>
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<u>L26</u>	15 and L25	2	<u>L26</u>
<u>L25</u>	115 and L24	34	<u>L25</u>
<u>L24</u>	112 and 113 and 114	1065	<u>L24</u>
<u>L23</u>	118 and L22	1	<u>L23</u>
<u>L22</u>	120 and L21	5	<u>L22</u>
<u>L21</u>	15 and 16	9	<u>L21</u>
<u>L20</u>	11 or 12 or 13 or 110	459206	<u>L20</u>
<u>L19</u>	117 and L18	5	<u>L19</u>
<u>L18</u>	112 or 113 or 114	8883	<u>L18</u>
<u>L17</u>	115 and L16	32	<u>L17</u>
<u>L16</u>	18 or 19	699	<u>L16</u>
<u>L15</u>	11 and 12 and 13 and 110	19334	<u>L15</u>
<u>L14</u>	dicamba or dichloroanis\$3 or dichloromethoxybenzo\$3 or (dichloro adj2 (anis\$3 or methoxybenzo\$3)) or mdba or dianat or banvel or mediben	2209	<u>L14</u>
<u>L13</u>	"2,4-d" or dichlorophenonoxyacet\$3 or (dichlorophenoxy adj acet\$3) or hedonal or spritz-hormin or fernimine or fernoxone or agrozone or desormone or netagron or planotox or dacamine or emulsamine or weedone or weedar or weed-b-g0n or weed-rhap	4273	<u>L13</u>
<u>L12</u>	glyphosate OR (roundup or spator or muster or glifonox or glycel) OR (phosphonomethylglycine or ((phosphonomethyl or (phosphono methyl)) glycine))	5678	<u>L12</u>
<u>L11</u>	18 and 19	5	<u>L11</u>
<u>L10</u>	14 near2 phosphor\$3	161278	<u>L10</u>
<u>L9</u>	L6 with 17	69	<u>L9</u>
<u>L8</u>	15 with L7	635	<u>L8</u>
<u>L7</u>	surfactant\$1 or (surface active)	310973	<u>L7</u>
<u>L6</u>	(ethylenediamine\$1) near3 (alkoxylate\$1 or methoxylate\$1 or ethoxylate\$1 or oxyalkyl\$4 or oxymethyl\$4 or oxyethyl\$4)	359	<u>L6</u>
<u>L5</u>	((fatty amine\$1) or tallowamine) near3 (alkoxylate\$1 or methoxylate\$1 or ethoxylate\$1 or oxyalkyl\$4 or oxymethyl\$4 or oxyethyl\$4)	1596	<u>L5</u>
<u>L4</u>	acid\$1	1803962	<u>L4</u>
<u>L3</u>	citric	100126	<u>L3</u>
<u>L2</u>	oxalic or malonic or succinic or glutaric	121739	<u>L2</u>
<u>L1</u>	formic or acetic or propionic or butyric or valeric or methanoic or ethanoic or propanoic or butanoic or pentanoic	278634	<u>L1</u>

END OF SEARCH HISTORY

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Search Results - Record(s) 1 through 5 of 5 returned.☒ 1. Document ID: US 20020173423 A1

L11: Entry 1 of 5

File: PGPB

Nov 21, 2002

PGPUB-DOCUMENT-NUMBER: 20020173423

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020173423 A1

TITLE: Ammonium glyphosate compositions and process for their preparation

PUBLICATION-DATE: November 21, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Massmann, Brent D.	Ballwin	MO	US	
Wang, John T.	St. Louis	MO	US	
Campbell, Dwane H.	Wildwood	MO	US	

US-CL-CURRENT: 504/106

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC
Draw Desc	Image										

☒ 2. Document ID: US 20020123430 A1

L11: Entry 2 of 5

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWMC
Draw Desc	Image										

☐ 3. Document ID: US 5776876 A

L11: Entry 3 of 5

File: USPT

Jul 7, 1998

US-PAT-NO: 5776876

DOCUMENT-IDENTIFIER: US 5776876 A

TITLE: Aqueous acidic filter cleaning composition for removing organic biguanide deposits

DATE-ISSUED: July 7, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Garris; John P.	Cumming	GA		

US-CL-CURRENT: 510/247; 210/169, 210/749, 210/753, 210/754, 510/199, 510/253,
510/255, 510/269, 510/362, 510/364, 510/365, 510/413, 510/421, 510/432, 510/434

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWMC
Draw Desc	Image									

☒ 4. Document ID: US 5332714 A

L11: Entry 4 of 5

File: USPT

Jul 26, 1994

US-PAT-NO: 5332714

DOCUMENT-IDENTIFIER: US 5332714 A

TITLE: Defoamer for liquid wetting agents and low-foam liquid plant protection agents

DATE-ISSUED: July 26, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Albrecht; Konrad	Kelkheim			DE
Kocur; Jean	Hofheim am Taunus			DE

US-CL-CURRENT: 504/362; 504/127, 504/133, 504/141, 504/148, 504/149, 504/204,
504/205, 504/206, 504/364, 516/125, 516/200

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWMC
Draw Desc	Image									

☐ 5. Document ID: US 5156675 A

L11: Entry 5 of 5

File: USPT

Oct 20, 1992

US-PAT-NO: 5156675
DOCUMENT-IDENTIFIER: US 5156675 A

TITLE: Ink for ink jet printing

DATE-ISSUED: October 20, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Breton; Marcel P.	Mississauga			CA
Pontes; Fatima M.	Kitchener			CA
Henseleit; Kerstin M.	Toronto			CA
Helbrecht; Barbel	Oakville			CA
Croucher; Melvin D.	Oakville			CA
Wong; Raymond W.	Mississauga			CA

US-CL-CURRENT: 106/31.43; 106/31.46, 106/31.58, 106/31.75, 106/31.76, 106/31.86,
347/100

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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Terms	Documents
18 and 19	5

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L11: Entry 1 of 5

File: PGPB

Nov 21, 2002

DOCUMENT-IDENTIFIER: US 20020173423 A1

TITLE: Ammonium glyphosate compositions and process for their preparation

Detail Description Paragraph (18):

[0034] In general, the adjuvant added to the reaction mixture may be a nonionic surfactant, cationic surfactant, anionic surfactant, amphoteric surfactant, silicone surfactant, fluorocarbon surfactant or lubricant. Exemplary nonionic surfactants include alkylpolyglucosides; glycerol esters such as glyceryl monolaurate, and ethoxylated glyceryl monococoate; ethoxylated castor oil; ethoxylated reduced sugar esters such as polyoxyethylene sorbitol monolaurate; esters of other polyhydric alcohols such as sorbitan monolaurate and sucrose monostearate; ethoxylated amides such as polyoxyethylene cocoamide; ethoxylated esters such as monolaurate of polyethylene glycol 1000 and dilaurate of polyethylene glycol 6000; ethoxylated alkyl or arylphenols such as nonylphenol ethoxylate, octylphenol ethoxylates, dodecylphenol ethoxylates, dinonylphenol ethoxylates and tristyrilphenol ethoxylates; alcohol ethoxylates such as fatty alcohol ethoxylates (e.g., oleyl alcohol ethoxylate), tridecylalcohol ethoxylates and other alcohol ethoxylates such as neodols and oxoalcohol ethoxylates; and ethylene oxide/propylene oxide copolymers such as pluronic type, tetronic type, or tergitol XH type. Exemplary cationic surfactants include alkylamine ethoxylates (including etheramines and diamines) such as tallowamine ethoxylate, cocoamine ethoxylate, etheramine ethoxylate, -tallow ethylenediamine ethoxylate and amidoamine ethoxylates; alkylamine quaternary amines such as alkoxylated quaternary amines (e.g., ethoxylated quaternary amines or propoxylated quaternary amines); alkylamine acetates such as tallowamine acetate or octylamine acetate; and amine oxides such as ethoxylated amine oxides (e.g., N,N-bis(2-hydroxyethyl)cocoamine -oxide), nonethoxylated amine oxides (e.g., cethyltrimethylamine-oxide) and amidoamine oxides. Exemplary anionic surfactants include fatty soaps such as ammonium tallowate and sodium stearate; alkyl sulfates such as sodium C.sub.8-10 alcohol sulfate, sodium oleyl sulfate, and sodium lauryl sulfate; sulfated oils such as sulfated castor oil; ether sulfates such as sodium lauryl ether sulfate, ammonium lauryl ether sulfate, and ammonium nonylphenol ether sulfate; sulfonates such as petroleum sulfonates, alkylbenzene sulfonates (e.g., sodium (linear) dodecylbenzene sulfonate or sodium (branched) dodecylbenzene sulfonate), alkyl naphthalene sulfonates (e.g., sodium dibutyl naphthalene sulfonate), alkyl sulfonates (e.g., alpha olefin sulfonates), sulfosuccinates such as dialkylsulfosuccinates (e.g., sodium dioctylsulfosuccinate) and monoalkylsulfosuccinate and succinamides (e.g., disodium laurylsulfosuccinate and disodium N-alkylsulfosuccinamate-); sulfonated amides such as sodium N-methyl N-coco taurate; isethionates such as sodium cocoyl isethionate; sarcosinates such as N-lauroyl sarcosine; and phosphates such as alkylether ethoxylate phosphates and alkylarylether ethoxyated phosphates. Exemplary amphoteric surfactants include betaines such as simple betaines (e.g., cocodimethylbetaine), sulfobetaines, amidobetaines, and cocoamidobetaines; imidazolinium compounds such as disodium lauroamphodiacetate, sodium cocoamphoacetate, sodium cocoamphopropionate, disodium cocoaminodipropionate, and sodium cocoamphohydroxypropyl sulfonate; and other amphoteric surfactants such as N-alkyl, N,-bis(2-hydroxyethyl)glycine and alkylaminodipropionates. Exemplary lubricants include fatty acids such as oleic acid; silicon oils such as polydimethylsiloxane; fatty esters such as corn oil, sugars and reduced sugars. In a preferred embodiment, at least one adjuvant added to the reaction mixture is cationic, amphoteric or selected from the class of surfactants known as alkyl polyglycosides (APGs) and polyoxyethylene C.sub.16-22 alkylethers (each of which is nonionic). Polyoxyethylene derivatives of such

cationic and amphoteric surfactants are particularly preferred. The term "alkyl" is used in the present context to denote one or more linear or branched, saturated or unsaturated hydrocarbyl chains having, unless otherwise specified, about 8 to about 22 carbon atoms.

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L11: Entry 1 of 5

File: PGPB

Nov 21, 2002

PGPUB-DOCUMENT-NUMBER: 20020173423

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020173423 A1

TITLE: Ammonium glyphosate compositions and process for their preparation

PUBLICATION-DATE: November 21, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Massmann, Brent D.	Ballwin	MO	US	
Wang, John T.	St. Louis	MO	US	
Campbell, Dwane H.	Wildwood	MO	US	

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
Monsanto Technology LLC				02

APPL-NO: 10/ 122806 [PALM]

DATE FILED: April 15, 2002

RELATED-US-APPL-DATA:

Application is a non-provisional-of-provisional application 60/285731, filed April 23, 2001,

INT-CL: [07] A01 N 25/32

US-CL-PUBLISHED: 504/106

US-CL-CURRENT: 504/106

REPRESENTATIVE-FIGURES: NONE

ABSTRACT:

A process is provided for preparing a downstream processable ammonium glyphosate paste. The process includes mixing in a reactor (i) particulate glyphosate acid, (ii) ammonia, (iii) adjuvant, and (iii) water. The reaction of glyphosate acid with ammonia causes the generation of heat resulting in the partial evaporation of the water such that an ammonium glyphosate paste is formed, having a moisture content of about 2% to about 20% by weight. The addition of the adjuvant to the reactor (i) increases the rate at which the glyphosate acid and ammonia react to form ammonium glyphosate and/or (ii) reduces the flow resistance of the reaction mass as it is being conveyed to the product discharge region of the reactor. The ammonium glyphosate paste may then be further processed to form a granular herbicidal composition.

REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from U.S. provisional application Serial No. 60/285,731, filed on Apr. 23, 2001, the entire disclosure of which is incorporated

herein by reference.

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L11: Entry 2 of 5

File: PGPB

Sep 5, 2002

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

Summary of Invention Paragraph (64):

[0062] The composition of the second enhanced application mixture differs from the composition of the first enhanced application mixture only with respect to the nature of the surfactant system contained therein, with the second enhanced application mixture containing an ethoxylated tallowamine surfactant having the formula: 4

Summary of Invention Paragraph (180):

[0177] Some preferred cationic surfactants include alkylamine ethoxylates (including etheramines and diamines) such as tallowamine ethoxylate, cocoamine ethoxylate, etheramine ethoxylate, N-tallow ethylenediamine ethoxylate and amidoamine ethoxylates; alkylamine quaternary amines such as alkoxylated quaternary amines (e.g., ethoxylated quaternary amines or propoxylated quaternary amines); alkylamine acetates such as tallowamine acetate or octylamine acetate; and amine oxides such as ethoxylated amine oxides (e.g., N,N-bis(2-hydroxyethyl)cocoamine N-oxide), nonethoxylated amine oxides (e.g., cethyldimethylamine N-oxide) and amidoamine oxides.

CLAIMS:

84. An aqueous herbicidal composition comprising: glyphosate or a salt or ester thereof, in solution in an aqueous medium in a concentration that is biologically effective when the composition is diluted in a suitable volume of water to form an enhanced application mixture and applied to the foliage of a susceptible plant; a surfactant component in solution or stable suspension, emulsion, or dispersion in said medium, comprising one or more surfactant(s); and oxalic acid or a salt thereof, wherein the concentration of oxalic acid or said salt and the nature of said surfactant are such that a first difference between: (i) the growth rate of a plant treated with a first enhanced application mixture prepared by dilution of said aqueous herbicidal composition with water and (ii) the growth rate of a plant treated with a first reference application mixture devoid of oxalic acid and any said salt but otherwise having the same composition as said first enhanced application mixture is greater than a second difference between: (iii) the growth rate of a plant treated with a second enhanced application mixture and (iv) the growth rate of a plant treated with a second reference application mixture devoid of oxalic acid and any said salt but otherwise having the same composition as said second enhanced application mixture, wherein the composition of said second enhanced application mixture differs from the composition of said first enhanced application mixture only with respect to the nature of the surfactant system contained therein, said second enhanced application mixture containing one of the following cationic surfactants selected from the group consisting of: an ethoxylated tallowamine surfactant having the formula: 51 wherein R is a mixture of predominantly C_{sub}16 and C_{sub}18 alkyl and alkenyl chains derived from tallow and the total of m+n is an average number of about 15, wherein the weight ratio of glyphosate a.e. to surfactant in the second enhanced application mixture is about 2:1; cocoalkyltrimethylammonium chloride, wherein the weight ratio of glyphosate a.e. to surfactant in the second enhanced application mixture is about 4:1; and POE(15)cocoalkylmonomethylammonium chloride, wherein the weight ratio of glyphosate a.e. to surfactant in the second enhanced application mixture is about 4:1.

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L11: Entry 2 of 5

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
Monsanto Technology LLC				02

APPL-NO: 09/ 988353 [PALM]
DATE FILED: November 19, 2001

RELATED-US-APPL-DATA:

Application 09/988353 is a continuation-in-part-of PENDING application 09/926521, filed 2, 0000,
Application 09/926521 is a a-371-of-international WO application PC/T/US01/16550, filed May 21, 2001, UNKNOWN
Application is a non-provisional-of-provisional application 60/206628, filed May 24, 2000,
Application is a non-provisional-of-provisional application 60/205524, filed May 19, 2000,
Application is a non-provisional-of-provisional application 60/273234, filed March 2, 2001,
Application is a non-provisional-of-provisional application 60/274368, filed March 8, 2001,

INT-CL: [07] A01 N 57/18, A01 N 25/04, A01 N 25/16

US-CL-PUBLISHED: 504/206; 504/363

US-CL-CURRENT: 504/206; 504/363

ABSTRACT:

Pesticidal concentrate and spray compositions are described which exhibit enhanced efficacy due to the addition thereto of a compound which increases cell membrane permeability, suppresses oxidative burst, or increases expression of hydroxyproline-rich glycoproteins.

REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. application Ser. No. 09/926,521, filed Nov. 14, 2001, which was the National Stage of International Application No. PCT/US01/16550, filed May 21, 2001, which claims the benefit of U.S. Provisional Application No. 60/206,628, filed May 24, 2000, U.S. Provisional Application No. 60/205,524, filed May 19, 2000, U.S. Provisional Application No. 60/273,234, filed Mar. 2, 2001, and U.S. Provisional Application No. 60/274,368, filed Mar. 8, 2001.

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L11: Entry 4 of 5

File: USPT

Jul 26, 1994

DOCUMENT-IDENTIFIER: US 5332714 A

TITLE: Defoamer for liquid wetting agents and low-foam liquid plant protection agents

Brief Summary Text (22):

c) a surfactant from the group comprising the perfluoro-(C.sub.6 -C.sub.18)alkylphosphinic acids or -alkylphosphonic acids or of the salts of this surfactant, preferably from the group comprising its alkali metal salts, ammonium salts, salts with C.sub.1 -C.sub.18 -alkylamines, C.sub.1 -C.sub.18 -alkylamino-oxethylates or ethylenediamine ethoxylates, or mixtures of the surfactants, and

Brief Summary Text (32):

Suitable perfluoroalkyl-group-containing surfactants (component c) are, in particular, perfluoro (C.sub.6 -C.sub.12)alkylphosphinic acids and -phosphonic acids and their sodium salts, potassium salts, ammonium salts, C.sub.10 -C.sub.18 -alkylammonium salts, and also salts with C.sub.10 -C.sub.18 -alkylamine ethoxylates and ethylenediamine ethoxylates, such as

N,N,N',N'-tetrakis-(2,-hydroxypropyl)-ethylenediamine and N,N,N',N'-tetrakis-(2-hydroxyethyl)-ethylenediamine. The perfluoroalkyl-group-containing surfactants are commercially available, for example .RTM.Fluowet PP (mixture of C.sub.6 -C.sub.12 -perfluoroalkylphosphinic and -alkylphosphonic acids, Hoechst) or can be prepared by known methods. The perfluoroalkylated phosphinic and phosphonic acids are prepared according to DE-A 2,110,767 (GB-A-1,388,924), by oxidative hydrolysis of perfluoroalkyldiiodophosphone and bis(perfluoroalkyl)iodophosphone; the salts are prepared by neutralizing the acids obtained with the corresponding hydroxides or substituted amines in water or polar organic solvents, such as, for example, alcohols, DMF or NMP, it being preferred for the salts to be employed in dissolved form in this process.

Brief Summary Text (33):

In addition to the sulfato- and sulfonato-containing surfactants and the effective perfluoroalkyl-containing defoamers which have been found, the aqueous solutions which are added to the spray liquors, or the preparations containing plant protection agents, can also contain other customary formulation auxiliaries, such as, for example, nonionic surfactants from the alkyl polyglycol ether series, for example isotridecanol polyglycol ether, nonylphenol polyglycol ether, octylphenyl polyglycol ether or fatty amine ethoxylates, other antifreeze agents, such as ethylene glycol or propylene glycol, propylene glycol monomethyl ether, glycerol, isopropanol and urea, and also other dispersants and emulsifiers, as are listed, for example, in McCutcheon, and organic solvents and fillers, such as water-soluble substances, for example ammonium sulfate, urea, sodium sulfate, sodium sulfite and sodium bisulfite.

Brief Summary Text (42):

The defoamers (c) are also effective when they are contained in amounts of preferably 0.05 to 5% by weight, particularly 0.05-1% by weight and in particular 0.2 to 0.5% by weight as a solution in the aqueous solution or dispersion of active substance, and this solution or dispersion of active substance in water is applied, with sulfato- and sulfonato-containing surfactants (c) and optionally other auxiliaries (e), such as, for example, alkyl polyglycol ethers or fatty amine ethoxylates, being added separately to the solution which is then diluted, before

WEST[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 5 of 5 returned.**☐ 1. Document ID: US 20020160916 A1

L19: Entry 1 of 5

File: PGPB

Oct 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020160916

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020160916 A1

TITLE: Agricultural formulation

PUBLICATION-DATE: October 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Volgas, Greg	Bartlett	TN	US	
Roberts, Johnnie R.	Memphis	TN	US	
Hayes, Amanda	Memphis	TN	US	

US-CL-CURRENT: [504/194](#); [504/195](#), [504/196](#), [504/197](#), [504/198](#), [504/362](#), [504/363](#),
[504/364](#), [504/365](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KM/C
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☒ 2. Document ID: US 20020123430 A1

L19: Entry 2 of 5

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: [504/206](#); [504/363](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☒ 3. Document ID: US 6458745 B1

L19: Entry 3 of 5

File: USPT

Oct 1, 2002

US-PAT-NO: 6458745

DOCUMENT-IDENTIFIER: US 6458745 B1

TITLE: Solid phytosanitary agent

DATE-ISSUED: October 1, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Runge; Frank	Maxdorf			DE
Zwissler; Georg Konrad	Bad Durkheim			DE
Horn; Dieter	Heidelberg			DE
End; Lutz	Mannheim			DE
Kober; Reiner	Fussgonheim			DE
Schneider; Karl-Heinrich	Kleinkarlbach			DE
Stadler; Reinhold	Kirrweiler			DE
Ziegler; Hans	Mutterstadt			DE
Rademacher; Wilhelm	Limburgerhof			DE
Schmidt; Oskar	Schifferstadt			DE
Harries; Volker	Frankenthal			DE
Saur; Reinhold	Bohl-Iggelheim			DE

US-CL-CURRENT: 504/359; 424/405, 504/118

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KMC

☒ 4. Document ID: US 6180566 B1

L19: Entry 4 of 5

File: USPT

Jan 30, 2001

US-PAT-NO: 6180566

DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.l; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 5. Document ID: US 5795847 A

L19: Entry 5 of 5

File: USPT

Aug 18, 1998

US-PAT-NO: 5795847

DOCUMENT-IDENTIFIER: US 5795847 A

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

DATE-ISSUED: August 18, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.l; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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L19: Entry 1 of 5

File: PGPB

Oct 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020160916
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020160916 A1

TITLE: Agricultural formulation

PUBLICATION-DATE: October 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Volgas, Greg	Bartlett	TN	US	
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APPL-NO: 10/ 081627 [PALM]
DATE FILED: February 20, 2002

RELATED-US-APPL-DATA:

Application is a non-provisional-of-provisional application 60/270311, filed February 21, 2001,

INT-CL: [07] A01 N 57/00, A01 N 57/18, A01 N 25/02, A01 N 25/04, A01 N 25/16

US-CL-PUBLISHED: 504/194; 504/195, 504/196, 504/197, 504/198, 504/362, 504/363, 504/364, 504/365

US-CL-CURRENT: 504/194; 504/195, 504/196, 504/197, 504/198, 504/362, 504/363, 504/364, 504/365

ABSTRACT:

The invention pertains to new composition and a method for increasing the solubility of various agricultural compounds in water at a low pH. The compounds included in this patent are typically not soluble at pH ranges less than 7 to produce commercially viable liquid concentrates. This method requires the use of amine-containing surfactants and organic acids to lower the pH of various compounds and also keep them soluble in water.

RELATED APPLICATIONS

[0001] This application claims benefit to U.S. Provisional Serial No. 60/270,311 filed Feb. 21, 2001 which is incorporated by reference in its entirety for all useful purposes.

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L19: Entry 2 of 5

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
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ASSIGNEE-INFORMATION:

NAME	CITY	STATE	COUNTRY	TYPE CODE
Monsanto Technology LLC				02

APPL-NO: 09/ 988353 [PALM]
DATE FILED: November 19, 2001

RELATED-US-APPL-DATA:

Application 09/988353 is a continuation-in-part-of PENDING application 09/926521, filed 2, 0000,
Application 09/926521 is a a-371-of-international WO application PC/T/US01/16550, filed May 21, 2001, UNKNOWN
Application is a non-provisional-of-provisional application 60/206628, filed May 24, 2000,
Application is a non-provisional-of-provisional application 60/205524, filed May 19, 2000,
Application is a non-provisional-of-provisional application 60/273234, filed March 2, 2001,
Application is a non-provisional-of-provisional application 60/274368, filed March 8, 2001,

INT-CL: [07] A01 N 57/18, A01 N 25/04, A01 N 25/16

US-CL-PUBLISHED: 504/206; 504/363

US-CL-CURRENT: 504/206; 504/363

ABSTRACT:

Pesticidal concentrate and spray compositions are described which exhibit enhanced efficacy due to the addition thereto of a compound which increases cell membrane permeability, suppresses oxidative burst, or increases expression of hydroxyproline-rich glycoproteins.

REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. application Ser. No. 09/926,521, filed Nov. 14, 2001, which was the National Stage of International Application No. PCT/US01/16550, filed May 21, 2001, which claims the benefit of U.S. Provisional Application No. 60/206,628, filed May 24, 2000, U.S. Provisional Application No. 60/205,524, filed May 19, 2000, U.S. Provisional Application No. 60/273,234, filed Mar. 2, 2001, and U.S. Provisional Application No. 60/274,368, filed Mar. 8, 2001.

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L19: Entry 3 of 5

File: USPT

Oct 1, 2002

DOCUMENT-IDENTIFIER: US 6458745 B1

TITLE: Solid phytosanitary agent

Brief Summary Text (15):

The salts are prepared by reaction with acids, for example hydrohalic acids such as hydrofluoric acid, hydrochloric acid, hydrobromic acid or hydroiodic acid or sulfuric acid, phosphoric acid, nitric acid or organic acids such as acetic acid, trifluoroacetic acid, trichloroacetic acid, propionic acid, glycolic acid, lactic acid, succinic acid, citric acid, benzoic acid, cinnamic acid, oxalic acid, formic acid, benzenesulfonic acid, p-toluenesulfonic acid, methanesulfonic acid, salicylic acid, p-aminosalicylic acid or 1,2-naphthalenedisulfonic acid.

Brief Summary Text (18):

Herbicidal active ingredients which may be mentioned are: thiadiazoles: bromobutide, dimepiperate, diphenamid, etobenzanid (benzchlomet), flamprop-methyl, isoxaben, naptalame, pronamid (propyzamid), propanil, anilides: anilofos, mefenacet 2,4-D, 2,4-DB, clomeprop, dichlorprop, dichlorprop-P, fluroxypyr, MCPB, napropamide, napropanilide, triclopyr, bleaches: diflufenican, fluoroachloridone, flupoxam, fluridone, pyrazolate, sulcotrione (chlormesulone), carbamates: butylate, chlorpropham, cycloate, desmedipham, EPTC, esprocarb, molinate, orbencarb, pebulate, phenmedipham, propham, prosulfocarb, pyributicarb, thiobencarb (benthiocarb), thiocarbazil, triallate, vernolate, quinolinecarboxylic acids: quinclorac, quinmerac, chloracetanilides: acetochlor, alachlor, butachlor, butenachlor, metazachlor, metolachlor, pretilachlor, thenylchlor, cyclohexenones: alloxymid, clethodim, cycloxydim, sethoxydim, tralkoxydim, dihydrobenzofuran: ethofumesate, dihydrofuran-3-one: flurtamone, dinitroanilines: benefin, butralin, dinitramin, ethalfluralin, fluchloralin, oryzalin, pendimethalin, prodiamine, trifluralin, dinitrophenols: bromofenoxim, dinoterb, DNOC, diphenyl ethers: acifluorfen-sodium, aclonifen, bifenox, chlornitrofen (CNP), ethoxyfen, fluoroglycofen-ethyl, fomesafen, lactofen, oxyfluorfen, urea: chlorbromuron, chlortoluron, cumyluron, dibenzyluron, dimefuron, diuron, dymron, fluometuron, isoproturon, linuron, methabenzthiazuron, metobenzuron, neburon, siduron, imidazolinones: imazaquin, oxadiazoles: oxadiargyl, oxadiazon, oxirane: tridiphane, phenols: bromoxynil, ioxynil phenoxyphenoxypropionic esters: clodinafop, cyhalofop-butyl, diclofop-methyl, fenoxaprop-ethyl, fenoxaprop-p-ethyl, fenthiapropethyl, fluazifop-butyl, fluazifop-p-butyl, haloxyfop-ethoxyethyl, haloxyfop-methyl, haloxyfop-p-methyl, isoxapyrifop, propaquizafop, quizalofop-ethyl, quizalofop-p-ethyl, quizalofop-tefuryl phenylpropionic acid: chlorophenprop-methyl, ppi: benzofenap, flumiclorac-pentyl, sulfentrazone, pyridazines: chloridazon, norflurazon, pyridate, pyridinecarboxylic acids: dithiopyr, picloram, thiazopyr, pyrimidyl ethers: pyriothiac-acid, KIH-6127, sulfonamides: flumetsulam, metosulam, sulfonylureas: amidosulfuron, azimsulfuron, bensulfuron-methyl, chlorimuron-ethyl, chlorsulfuron, cinosulfuron, cyclosulfamuron, ethamsulfuron-methyl, flazasulfuron, halosulfuron-methyl, imazosulfuron, primisulfuron, prosulfuron, pyrazosulfuron-ethyl, rimsulfuron, sulfometuron-methyl, thifensulfuron-methyl, triasulfuron, triflusulfuron-methyl, triazines: ametryn, atrazine, cyanazine, dimethamethryn, prometryn, propazine, simazine, simetryn, terbutometon, terbutryn, terbutylazine, trietazine, triazolcarboxamide: triazofenamide, uracil: lenacil, various: benazolin, benfuresate, bensulide, butamifos, chlorthal-dimethyl (DCPA), cinmethylin, dichlobenil, fluorbentranil, mefluidide, piperophos.

Brief Summary Text (32):

Preferred low-molecular-weight stabilizers are mono- and diglycerides, esters of monoglycerides with acetic acid, citric acid, lactic acid or diacetyltartaric acid, alkylglucosides, sorbitane fatty esters, propylene glycol fatty esters, stearyl-2-lactylate, lecithine, fatty acid derivatives of ureas and urethanes such as dioleyleurea and N-oleyleurethane. Particularly suitable are ascorbyl palmitate and fatty acid carbonates such as dioleyle carbonate.

Brief Summary Text (46):

Preferred amphiphilic compounds which are suitable as coating materials are the following surfactants or, preferably, mixtures of these, in which the alkyl chains may be linear or branched and which have alkyl chains of in general between 8 and 20 carbon atoms: 1. Anionic surfactants soaps (alkali metal/alkaline earth metal/ammonium salts of the fatty acids), for example potassium stearate alkyl sulfates alkyl ether sulfates alkyl/isoalkylsulfonates alkylbenzenesulfonates, for example sodium dodecylbenzene sulfonate alkylphenol sulfonates alkylmethyl ester sulfonates acyl glutamates alkylsuccinic ester sulfonates alkyl mono/diphosphates sarcosinates, for example sodium lauroylsarcosinate taurates 2. Cationic surfactants alkyltrimethylammonium halides/alkylsulfates alkylpyridinium halides dialkyldimethylammonium halides/alkylsulfates 3. Nonionic surfactants alkoxyated animal/vegetable fats and oils, for example corn oil ethoxylates, castor oil ethoxylates, tallow fat ethoxylates glycerol esters, for example glycerol monostearate fatty alcohol alkoxyates and oxoalcohol alkoxyates fatty acid alkoxyates, for example oleic acid ethoxylates alkylphenol alkoxyates, for example isononylphenol ethoxylates fatty amine alkoxyates fatty acid amide alkoxyates sugar surfactants, for example sorbitan fatty acid esters (sorbitan monooleate, sorbitan tristearate), polyoxyethylene sorbitan fatty acid esters, alkyl polyglycosides, N-alkylgluconamides alkylmethyl sulfoxides alkylmethylphosphine oxides, for example tetradecyldimethylphosphine oxide 4. Zwitterionic surfactants sulfobetaines carboxybetaines alkylmethylamine oxides, for example tetradecyldimethylamine oxide 5. Polymer surfactants di- tri- and multi-block polymers of the (AB)x-, ABA and BAB type, for example polyethylene oxide-block-polypropylene oxide, polystyrene-block-polyethylene oxide AB comb polymers, for example polymeth/acrylate-comb-polyethylene oxide 6. Others perfluorinated surfactants silicone surfactants phospholipids, for example lecithin amino acid surfactants, for example N-lauroylglutamate.

CLAIMS:

14. The composition defined in claim 11, wherein the amphiphilic compound of the coating component (b) is at least one member selected from the group consisting of soaps, alkyl sulfates, alkyl ether sulfates, alkyl/isoalkylsulfonates, alkylbenzenesulfonates, alkylphenol sulfonates, alkylmethyl ester sulfonates, acyl glutamates, alkylsuccinic ester sulfonates, alkyl mono- and di-phosphates, sarcosinates, taurates, alkyltrimethylammonium halides and alkylsulfates, alkylpyridinium halides, dialkyldimethylammonium halides and alkylsulfates, alkoxyated animal and vegetable fats and oils, glycerol esters, fatty alcohol alkoxyates and oxoalcohol alkoxyates, fatty acid alkoxyates, alkylphenol alkoxyates, fatty amine alkoxyates, fatty acid amide alkoxyates, sugar surfactants, polyoxyethylene sorbitan fatty acid esters, alkyl polyglycosides, N-alkylgluconamides, alkylmethyl sulfoxides, alkylmethylphosphine oxides, sulfobetaines, carboxybetaines, alkylmethylamine oxides, (AB)x-, ABA or BAB, di- tri- and multi-block polymers AB comb polymers, perfluorinated surfactants, silicone surfactants, phospholipids, and amino acid surfactants.

15. The composition defined in claim 11, wherein the amphiphilic compound of the coating component (b) is at least one member selected from the group consisting of alkali metal, alkaline earth metal and ammonium salts of the fatty acids, alkyl sulfates, alkyl ether sulfates, alkyl- and isoalkylsulfonates, sodium dodecylbenzene sulfonate, alkylphenol sulfonates, alkylmethyl ester sulfonates, acyl glutamates, alkylsuccinic ester sulfonates, alkyl mono- and diphosphates, sodium lauroylsarcosinate, taurates, alkyltrimethylammonium halides and alkylsulfates, alkylpyridinium halides, dialkyldimethylammonium halides and alkylsulfates, corn oil ethoxylates, castor oil ethoxylates, tallow fat ethoxylates, glycerol monostearate, fatty alcohol alkoxyates and oxoalcohol alkoxyates, oleic acid ethoxylates, isononylphenol ethoxylates, fatty amine alkoxyates, fatty acid amide alkoxyates,

" " ' ' .

- . sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters, alkyl polyglycosides, N-alkylgluconamides, alkylmethyl sulfoxides, tetradecyldimethylphosphine oxide, sulfobetaines, carboxybetaines, tetradecyldimethylamine oxide, polyethylene oxide-block-polypropylene oxide, polystyrene-block-polyethylene oxide, polymethacrylate- and polyacrylate-comb-polyethylene oxide, perfluorinated surfactants, silicone surfactants, lecithin and N-lauroylglutamate.

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L19: Entry 4 of 5

File: USPT

Jan 30, 2001

DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

Abstract Text (1):

Stable, concentrated herbicide preparation comprising at least one herbicide with at least one amino group, at least one carboxylic acid group and at least one phosphor containing acid group suspended in finegrained form in a liquid phase, and at least 5% a by weight of a dissolved electrolyte; a process for producing said herbicide preparation and an activating additive (adjuvant) for combination with said herbicide preparation. Preferred suspensions comprise the herbicides glyphosate and glufosinate and the electrolyte ammonium sulphate, acting synergistically. It has not hitherto been possible to incorporate high concentrations of synergistic electrolytes in liquid concentrates of said herbicides.

Brief Summary Text (1):

The present invention relates to concentrated herbicide preparations comprising at least one herbicide being fine-grained and suspended in an aqueous electrolyte solution, said herbicide comprising at least one primary, secondary or tertiary amino group and at least one carboxylic acid group and at least one phosphor containing acid group, a process for producing it and an activating, concentrated additive for application in combination with said herbicides.

Brief Summary Text (5):

The adjustment of the viscosity of a suspension by changing an eventual content of electrolyte, surfactant and glycol being well-known, this technic, however, is almost never practiced at the final adjustment of viscosity, because the effect is very dependent of temperature and difficult to reproduce. Centrifugal tests are notoriously of no relevance for the long term stability of suspensions. HU 200076 does not disclose that the amount of emulsifier necessary for sufficient wetting of the suspended pesticide may be reduced when an electrolyte is added. Similarly it is not disclosed in HU 200076, that the surfactant or the viscosity regulating polysaccharide may be omitted following the addition of an electrolyte. There is a certain overlap between the intervals of added electrolyte in HU 200076 and in the present invention, but the optimal amount of electrolyte in the present invention is above the most effective in HU 200076. The described pesticides are atrazine, isoproturon, bensultap, fluomethuron, lindane, thiophanat-methyl and elementary sulfur. None of these pesticides comprises a carboxylic acid group or a phosphor containing acid group.

Brief Summary Text (6):

It is well known that ammonium sulphate acts synergistically on the biological effect of glyphosate and glufosinate. For instance the patent literature contains many examples of combinations of glyphosate and ammonium sulphate, and in practice the farmer usually adds supplementary ammonium sulphate when diluting the glyphosate for use.

Brief Summary Text (7):

Danish patent application no. 2348/88 describe liquid, aqueous solutions of glyphosate with ethoxylated monoamines as surfactants. The possibility of dissolving additional ammonium sulphate exists, but this will lead to a lowering of the dissolvable quantity of glyphosate. Therefore, the maximum amount of glyphosate in a

• solution containing 280 g/l ammonium sulphate is approximately 120 g/l.

Brief Summary Text (8):

UK patent application GB 2.233.229 A describes a similar system, the ethoxylated monoamines being replaced by ethoxylated diamines. The typical, aqueous solutions contain 200 g/l ammonium sulphate and 75 g/l of glyphosate as its isopropylammonium salt.

Brief Summary Text (9):

UK patent application GB 2.245.170 A claims solutions of glyphosate containing ethoxylated phosphate esters as surfactants. In the examples, where ammonium sulphate has been added supplementary to the formulation in amounts of 200-300 g/l, the glyphosate constitutes 75 g/l corresponding to 100 g/l of the isopropylammonium salt.

Brief Summary Text (10):

In European patent application EP 441.764 A1 is mentioned, that alkoxyated, quaternary ammonium compounds especially coethoxylated-propoxylated quaternary ammonium compounds, is environmentally more acceptable and less skin and eye irritating than ethoxylated fatty amines. It is stated, that aqueous solutions of glyphosate in combinations with said surfactants also can contain ammonium sulphate, but no examples with such formulations are given. On the other hand two solid compositions containing ammonium sulphate are described.

Brief Summary Text (11):

In European patent application EP 498.785 A1 glyphosate formulations are mentioned, which contain esters of sorbitol and fatty acids as surfactants in combination with another surfactant. It is mentioned, that these formulations whether aqueous solutions or solid, finely distributed formulations may also contain ammonium sulphate or other inorganic ammonium salts. The system, however, seems to be best suited for solid formulations.

Brief Summary Text (12):

European patent application EP 498.145 A1 describes solid compositions containing glyphosate as free acid or salt, an inorganic ammonium salt (preferably ammonium sulphate) and alkyl-glycoside or alkylpolyglycoside as surfactant.

Brief Summary Text (13):

European patent application EP 448.538 A1 describes combinations of glyphosate and oxyfluorfen in solid formulations, additionally containing ammonium sulphate and other inorganic compounds.

Brief Summary Text (14):

International patent application WO 92/12637 deals with solid, preferably extruded or granulated formulations containing glyphosate in combination with alkaline compounds. A reaction takes place between the glyphosate and the alkaline compound either during the production process or during the subsequent mixing with the diluent water to totally or partly neutralize the glyphosate as salt whereby it dissolves easier and more quickly. The formulations shown besides comprise surfactants and frequently ammonium sulphate.

Brief Summary Text (15):

In danish patent application no. 6490/89 solid formulations of glyphosate in acid form containing a saturated C.sub.16-18 -fatty alcohol, being ethoxylated with approximately 25 moles ethyleneoxide are described. The formulations may additionally contain supplementary ammonium sulphate.

Brief Summary Text (17):

European patent application 243.872 A1 discloses pesticide preparations, comprising inter alia glyphosate dispersed in an oil containing, liquid phase. The addition to the formulations of ammonium sulphate is not mentioned.

Brief Summary Text (18):

French patent application 2.661.315 discloses the suspension of glyphosate and derivatives thereof in an organic solvent. The organic solvent might be water

miscible, and it is mentioned that up to 50% of the solvent may be replaced by water. Furthermore the composition may comprise ammonium sulphate, which is characterized as an adjuvant. The form of the ammonium sulphate of the composition is not apparent from the description, but in the 5 examples of the application, the ammonium sulphate together with the glyphosate compound seems to be totally suspended or dissolved only to a limited extent in the liquid phase.

Brief Summary Text (19):

International patent application WO 92/21686 describes the production of trimethylsulfonium salt of glyphosate for instance by the reaction of glyphosate trimethylsulfonium hydrogen sulphate with an alkaline compound like ammonia. The application does not mention herbicidal suspensions in relation to the present invention. No description is found, neither in the patent description nor in the examples, of significant amounts of glyphosate being at any time suspended in an electrolyte solution and certainly not in a stable form. The principles of the present invention for formulating glyphosate, seem never to have been considered.

Brief Summary Text (20):

Many of the examples shown demonstrate the desirability of combining the herbicides glyphosate or glufosinate with ammonium sulphate and selected surfactants in one and the same formulation. Advantageously the formulation is as concentrated as possible.

Brief Summary Text (21):

As far as liquid, dissolved formulations are concerned, the ammonium sulphate has a salting-out effect on the dissolved salts of glyphosate and glufosinate, as well as on the dissolved surfactants, and an upper limit exists of the concentration of the solution dependent on the actual surfactant. Environmental requirements on the detergents, for instance as to biodegradability, poor toxicity towards fishes and low skin and eye irritation may reduce still further the number of relevant wetting agents. Besides, the various surfactants differ significantly in their promotion of the biological effect of glyphosate and glufosinate.

Brief Summary Text (22):

Therefore, the trend in recent developments is towards solid, finely dispersed and non-dusty formulations. Although the solubility of ammonium sulphate in water is big, the speed of dissolution of ordinary, commercial, crystalline ammonium sulphate in water in practice is hardly acceptable. Consequently, the crystalline ammonium sulphate frequently needs to be grinded before being mixed with glyphosate or glufosinate or preferably a salt thereof, the selected surfactant(s) and additive(s) being subsequently added. Amongst the additives adhesives, absorbing fillers or anticaking agents should be mentioned, which are necessary to obtain a finely dispersed, non-caking and easily flowing, solid formulation of adequate storage stability. For these processes an expensive formulation equipment is necessary.

Brief Summary Text (26):

The present invention is based on the surprising fact, that a stable suspension can be attained by grinding a powdered herbicide with at least one amino group, at least one carboxylic acid group and at least one phosphor containing acid group in a bead mill in a highly concentrated solution of an electrolyte, which is not a surfactant per se, even if no surfactant is present.

Brief Summary Text (33):

Herbicides with at least one primary, secondary and/or tertiary amino group, at least one carboxylic acid group and at least one phosphor containing acid group normally have a relatively high solubility in water: about 0.1 corresponding to 1000 ppm or more, preferably at least 0.4% corresponding to 4000 ppm; by way of example the solubility of glyphosate is approximately 1% by weight in pure water at 20.degree. C.

Brief Summary Text (36):

The fact, that the grinding can take place without viscosity problems, even when no surfactant is added, is probably an essential condition for realising the invention. Even if a surfactant were added, the salting out from the electrolyte of the compound would generally be so extensive, that the wetting effect of the

insignificant amount still dissolved in the water phase would be too small to influence significantly on the grinding. The surfactant, however, is still desirable. As mentioned above said surfactant is necessary to ensure the optimum, biological effect of the formulation, and it might contribute to the stabilization of the final formulation, i.e. ensure that the formulation remains homogenous and does not separate. Apparently the finely grinded suspended herbicide and the added, finely distributed surfactant mutually interact to produce a mixture of an advantageous pseudoplastic or thixotropic character. Accordingly, it is possible to produce stable formulations comprising as the sole components water with dissolved electrolyte, suspended glyphosate and surfactant. It is even possible to produce stable suspensions using no surfactants at all.

Brief Summary Text (43):

d) In suspension preparations the amount of suspended solid material in a liquid phase must be below a certain upper limit. Normally the practical limit is about 500 g/l suspension. In glyphosate preparations containing ammonium sulphate the desired content of ammonium sulphate as well as that of glyphosate is high, and this is not possible to obtain if both compounds are to be suspended. When the ammonium sulphate is dissolved in the water phase and the glyphosate only is dispersed herein, it is possible to increase the amounts of ammonium sulphate as well as glyphosate.

Brief Summary Text (46):

The invention accordingly relates to stable, concentrated herbicide preparations comprising at least one herbicide in an amount of 5-58% by weight, said herbicide being fine-grained and suspended in a liquid aqueous phase, and said herbicide containing at least one primary, secondary or tertiary amino group, at least one carboxylic acid group and at least one phosphor containing acid group, said herbicide preparations being characterized by comprising at least 5% by weight of an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant.

Brief Summary Text (50):

Said suspended herbicides with at least one amino group, at least one carboxylic acid group and at least one phosphor containing acid group will frequently be such, where the phosphor containing acid group is selected from amongst phosphonic acids and phosphinic acids.

Brief Summary Text (51):

Specially preferred herbicides are glyphosate (N-(phosphonomethyl)-glycine), glufosinate (4-(hydroxy(methyl)phosphinoyl)-DL-homoalanine), bilanafos (4-hydroxy(methyl)phosphinoyl)-L-homoalanyl-L-alanyl-L-alanine and/or glyphosine (N,N-bis(p-hosphonomethyl)glycine), compare claim 4.

Brief Summary Text (58):

The invention also relates to stable, activating additives (adjuvants) on concentrated form, said adjuvants being active when admixed with glyphosate- and/or glufosinate preparations for combatting weeds, and said additives comprising at least one surfactant in an amount of 4-58% by weight, said surfactant being emulsified, suspended and/or dissolved in a liquid, aqueous phase; the composition of the adjuvant being further characterized by comprising at least one undissolved, fine-grained, not biologically active viscosity regulating filler acting to prevent separation of the surfactant, said viscosity regulating filler comprised in an amount of min. 0.3% by weight, and said liquid, aqueous phase being characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of min. 5%, compare claim 19.

Brief Summary Text (59):

Such a stable, activating additive is in a way an intermediate for the production of a concentrated suspension of glyphosate and/or glufosinate according to the invention, since the herbicide suspension can be produced from the additive simply by admixing finely grinded herbicide.

Brief Summary Text (60):

To produce the herbicidal solution/suspension for use, the farmer may make use of the additive, too. He just has to mix it with a glyphosate- or a glufosinate

preparation. The form of the herbicide is of minor importance in this connection, for instance a finely grinded powder, a solid granulate, a solution in an appropriate solvent or even a suspension may be used.

Brief Summary Text (72):

Preferred herbicidal compositions are such, in which the selected herbicide is glyphosate or glufosinate, and the selected electrolyte is ammonium sulphate.

Brief Summary Text (81):

Other preferred non-ionic surfactants are the ethoxylated, propoxylated or co-ethoxylated/propoxylated vegetable oils as for example ricinus oil; fatty acid esters of polyalcohol as for example sorbitol, in itself an emulsifier, which can be alkoxyated further (ethoxylated, propoxylated or co-ethoxylated/propoxylated); monoglycerides, diglycerides and polyalcoholates of natural fatty acids, which can be esterified further with C.sub.1-4 -monocarboxylic acid (e.g. acetic acid), C.sub.1-10 -dicarboxylic acid (e.g. adipic acid) and C.sub.1-6 -hydroxycarboxylic acid (e.g. lactic acid), and which can be alkoxyated further. Among other non-ionic wetting agents of relevance N-C.sub.4-16 -alkylpyrrolidone, specially N-C.sub.8-16 -alkylpyrrolidone, hydrocarbylcarboxylic amide and alkoxyated variants hereof; alkoxyated hydrocarbylmercaptane, alkoxyated thiophenol and alkoxyated thionaphtol should be mentioned.

Brief Summary Text (83):

The anionic surfactants may be selected from the groups comprising phosphate esters of for instance alkoxyated styrylphenols, alkylphenols and hydrocarbylalcohols; substituted and unsubstituted sulfonic acids; esters and halfesters of sulfosuccinic acid; monosulphate esters of C.sub.8-20 -hydrocarbylalcohol and styrylalcohol derivatives; naphtalene sulfonic acid derivatives; sulfonated vegetable oils and sulfonated mono- and diesters of natural fatty acids and sulfonated fatty acids; C.sub.8-30 -hydrocarbylcarboxylic acid; C.sub.8-30 -hydrocarbylene-dicarboxylic acids illustrated by C.sub.4-16 -alkylsubstituted succinic acid; polycarboxylic acids; taurides and sarkosides and sulfamido carbonic acids. Additional types of anionic surfactants are (the corresponding) derivatives of polymethylsiloxanes.

Brief Summary Text (90):

The present invention does not relate to the final dilutions made at the user level. The invention relates to concentrates only, being herbicide preparations or activating additives, which according to the invention are formulated in a new and more advantageous way. Since dilutions of use, made from the concentrates to a certain extent are well known, because they can be obtained by separate addition of ammonium sulphate to known products, and they are known to posses a particularly satisfying biological effect, it seems redundant to proove the effect of the described compositions. There might be differences in the pH-values of the dilutions. For instance the pH-value of the herbicide preparations according to the invention is frequently low, because the glyphosate is preferably used in its non-neutralized form, but this fact is known to be of no biological importance. Reference is made in this connection to Danish patent application 6490/89, specially dealing with glyphosate on non-neutralized form.

Brief Summary Text (98):

The compositions of the invention might comprise hygroscopic compounds, possibly also acting to stabilize pH and selected from the group consisting of hydroxycarboxylic acids, di- and tricarboxylic acids and their hydroxy acids, said acids being present as free acids and having a solubility in water at 20.degree. C. of at least 1% by weight. Examples of such acids are lactic acid, oxalic acid, succinic acid, tartaric and citric acid. The amount of these acids in the composition may be approximately 0.1-22%, preferably 0.4-16%, especially 1-11% and specially 2-7%.

Brief Summary Text (107):

Specially preferred herbicide suspensions comprise glyphosate suspended in ammonium sulphate, said suspensions being produced by adding sulfuric acid to solutions of the ammonium salt of glyphosate or adding ammonia to a solution of the sulfuric acid salt of glyphosate, preferably while cooling and continuously stirring.

Brief Summary Text (112):

The amount of the herbicide, for instance glyphosate or glufosinate, constitutes 0.2-4 kg/ha, preferably 0.3-3 kg/ha, especially 0.5-2.2 kg/ha and specially 0.8-1.5 kg/ha, calculated on an active ingredient basis.

Detailed Description Text (2):

Experiments 1-5 (see table A) demonstrates the suspension of glyphosate in free, non-neutralized form in an aqueous solution of ammonium sulphate. Calculated on the aqueous solution the amount of ammonium sulphate is 40% in all 5 experiments corresponding to a saturation in water at approximately 0.degree. C. In all of the examples, ethoxylated fatty amines are used as surfactants.

Detailed Description Text (3):

For the manufacture of the compositions 1 and 2 the Genamine (the ethoxylated fatty amine) was initially dissolved in a part of the water, following which the pH was adjusted with concentrated sulfuric acid to pH=3.5. The rest of the water was then added and subsequently the ammonium sulphate was stirred in, leading to the precipitation of the chief of the Genamine. The mixture was transferred as quantitatively as possible to a mini-mill with a volume of maximally 50 ml from the company Eiger Engineering Ltd., Warrington, Cheshire, England, being filled with 1-2 mm zirkonium oxide pearls. The mill was started immediately at its highest speed, and the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Attagel was added, and the grinding was continued for maximally 5 minutes.

Detailed Description Text (4):

For the manufacture of the compositions 3, 4 and 5, the ammonium sulphate was initially dissolved in the total amount of water, following which the concentrated sulfuric acid was added, and the solution was transferred to the mini-mill. The mill was started at its highest speed, following which the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Genamin was added immediately followed by Attagel, and the grinding was continued for approximately 5 minutes.

Detailed Description Text (6):

Samples of the above compositions were stored in 100 ml glass bottles with screw caps for 1 to approximately 4 weeks before the beginning of the accelerated testing. It was initially evaluated, whether the sample had separated a clear aqueous phase, and whether the surfactant had separated out on its own. The results of all evaluations are listed in table A. Subsequently the sample was shaken. The viscosity was visually evaluated, and the average particle size of the grinded glyphosate particles was estimated microscopically at 256.times.. (It is very difficult to use a particle sizer for so many samples, because the samples must be measured in concentrated salt solutions possibly further saturated with glyphosate, in order to ensure, that the samples are not dissolved in the water. It is also important that the concentrated salt solution does not contain undissolved impurities, which might disturb the measurements). It was also estimated, whether the added surfactants had separated out as oily drops. If so, the estimated size of the drops was noted. If no oily drops could be observed, a "n:d." (not detected) is stated in the table. It should be noted, that any microscopic airbubbles present may give rise to a false positive result.

Detailed Description Text (18):

After this testing period both groups of samples were cooled to ambient temperature and evaluated as mentioned above. Supplementary the speed of dissolution was determined as follows: 1 ml suspension was pipetted off and placed in a 150 ml beaker containing 100 ml deionized water. The mixture was stirred on a magnetic stirrer of moderate speed using a 4 cm magnet so as to produce an approximately 1 cm deep vortex in the diluent water, and the period of time until no more undissolved glyphosate could be observed was measured in seconds. All observations are listed in table A.

Detailed Description Text (24):

Experiments 6-10, 11-15, 16-20, 21-25 and 26-29 in the tables B, C, D, E, and F describe glyphosate compositions comprising various surfactants in varying amounts.

The ratio glyphosate/surfactant is about 2/1 corresponding to the usual ratio in most commercial products. The amount of finely distributed fillers varies from 0 to 2% by weight. In all of the experiments the amount of the electrolyte ammonium sulphate is varying from app. 20 to 27% by weight. The grinding is performed in a mini-mill as described for the samples 3-5 in table A, the sulfuric acid addition, however, being omitted.

Detailed Description Text (30):

Experiments 31-35, 36-40, 41-45 and 46-49 in the tables G, H, I and J relate to various glyphosate compositions. Experiments 31-33 (table G) relate to compositions with ammonium salts different from ammonium sulphate. Experiments 34 and 35 (table G) relates to compositions comprising herbicide only suspended in an electrolyte solution. Experiments 36-40 (table H) show the use of potassium thiocyanate, sodium bromide and ammonium acetate as electrolyte. In the experiments 36 and 37, one of the acid groups in glyphosate is transformed into the sodium salt. In experiment 38, a little amount only of glyphosate is transformed into the sodium salt. In experiments 39 and 40, one of the acid groups in glyphosate is transformed into its ammonium salt. The experiments 41-45 (table I) relate to compositions comprising viscosity regulating, hygroscopic compounds. These are glycerine, propylene glycol, polyethylene glycol and lactic acid. Obviously the addition of these to the aqueous phase caused no tendency to separation of undissolved electrolyte. Experiments 46 and 47 relate to compositions further comprising oil. Experiment 48 and 49 relate to compositions comprising herbicide suspended in an electrolyte solution and small amounts of a viscosity regulating filler, but no surfactant.

Detailed Description Text (35):

In the experiments 46 and 47, the oils apparently do not disperse onto the grinded glyphosate, unlike the surfactants. This conclusion is based partly on the microscopy and partly on the experiment 46, in which the sample, which had been stored at varying temperatures, at the end of the experiment had separated two upper, clear phases. This was not observed in experiment 47. In both samples, the oil was uniformly re-distributed in the compositions after shaking.

Detailed Description Text (47):

The actual surfactant of the French example 1, a derivative of an ethoxylated fatty amine, is not commercially available, and is synthesized from ethylene oxide (extremely poisonous). Experiments 57 and 58 are intended to show, that compounds being comparable to this surfactant do not solubilize the ammonium sulphate. Consequently the amount of dissolved ammonium sulphate in example 1 in FR 2.663.315 can not exceed 5% w/w. Genamin S 25 is the most ethoxylated of the commercially available ethoxylated fatty amines. In experiment 57 Genamin S 25 is admixed with propylene glycol, before the mixture is added to the ammonium sulphate solution. PEG 400 is polyethylene glycol comprising on an average 8 moles of ethylene glycol. Since this compound does not comprise any hydrophobic group, it is more hydrophilic than ethoxylated fatty amines, and therefore probably has a greater impact on the solubility of ammonium sulphate. In experiment 58 PEG 400 is admixed with the propylene glycol, before the mixture is added to the ammonium sulphate solution. Both example 57 and 58 show a precipitation of ammonium sulphate following the addition of the propylene glycol mixtures to the aqueous ammonium sulphate solutions.

Detailed Description Text (52):

The product of example 60 has been produced by initially dissolving the ammonium sulphate in water (40% ammonium sulphate solution) followed by admixture of propylene glycol, leading to a precipitation of ammonium sulphate. The stirring on the mini-mill was started, and the glyphosate was added in the usual way followed by admixture of Genapol OX-130.

Detailed Description Text (54):

At normal temperatures an ammonium sulphate solution comprises approximately 40% ammonium sulphate. In experiment 61 20 g ammonium sulphate was dissolved in the water phase followed by addition of propylene glycol, causing a precipitation of ammonium sulphate. Another 20 g ammonium sulphate was finely grinded in a blender with a view to adding it slowly during grinding before the addition of glyphosate, before the addition of Genapol and after the addition of Genapol, respectively.

Detailed Description Text (58):

A preferred composition of glyphosate in electrolyte solution comprises the following:

Detailed Description Text (59):

169.1 g glyphosate

Detailed Description Text (64):

169.1 g glyphosate is dissolved in 266 g water and 80 g aqueous 25% w/w ammonia solution together with 159.4 g ammonium sulphate in a beaker and is transferred to another container under vigorous stirring.

Detailed Description Paragraph Table (2):

TABLE A Experiment no. 1 2 3 4 5 Component Composition in % Deionized 41.6 41.1 41.0 41.0 40.8 water Ammonium 27.8 27.4 27.4 27.4 27.2 sulphate Glyphosate, 20.8 20.6 20.6 20.6 20.4 98% Genamin T 6.9 6.8 150 (1) Genamin O 6.8 80 (2) Genamin C 6.8 100 (3) Genamin C 6.8 020 (4) Sulfuric app. 1.5 app. 1.4 2.1 2.1 2.7 acid, 98% Attagel (5) 1.4 2.7 2.1 2.1 2.1 Total weight 144 146 146 146 147 (g) Density 1.30 1.29 1.28 1.28 1.25 (g/ml) Glyphosate 270 266 264 264 255 (g/l) Ammonium 361 353 351 351 340 sulphate (g/l) Evaluation before storage Appearance 15% upp. 10% upp. 10% upp. 10% upp. 10% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- slightly slightly pseudo- pseudo- plastic viscous viscous plastic plastic Particle app. 10 app. 10 5-10 app. 10 5-10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. n.d. (.mu.m) Evaluation after storage at various temperatures Appearance 30% upp. 20% upp. 15% upp. 25% upp. 25% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity easily suffi- suffi- easily easily ently ently Particle app. 10 10-15 app. 10 10-15 5-10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 4 6 3 3 2 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance 15% upp. 5% upp. 10% upp. 10% inner 15% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- slightly pseudo- pseudo- pseudo- plastic viscous plastic plastic plastic Particle app. 10 10-15 app. 10 10-15 app. 10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 3 4 4 2 7 dissol. (s)

Detailed Description Paragraph Table (3):

TABLE B Experiment no. 6 7 8 9 10 Component Composition in % Deionized 40.5 40.5 40.5 40.5 40.5 water Ammonium 27.0 27.0 27.0 27.0 27.0 sulphate Glyphosate, 20.3 20.3 20.3 20.3 98% Ethoquad 10.2 C/25 (6) Emcol CC 10.2 55 (7) Ampholyt 10.2 SKKP-70 (8) Synperonic 10.2 NP-10 (9) Tween 20 10.2 (10) Attagel (5) 2.0 2.0 2.0 2.0 2.0 Total weight 148 148 148 148 148 (g) Density 1.28 1.27 1.27 1.27 1.27 (g/ml) Glyphosate 260 258 258 258 258 (g/l) Ammonium 346 343 343 343 343 sulphate (g/l) Evaluation before storage Appearance no se- no se- 15% lower 15% lower 10% lower paration paration cl. phase cl. phase cl. phase Viscosity slightly easily slightly slightly slightly viscous viscous viscous viscous Particle app. 10 app. 10 10-15 10-15 10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. 25-100 (.mu.m) Evaluation after storage at various temperatures Appearance 20% upp. 30% upp. no se- 20% upp. 15% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity easily easily passende passende passende viscous viscous viscous Particle app. 5 app. 10 app. 10 app. 10 10-15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 2 2 3 3 2 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance 10% upp. 25% upp. no se- no se- 10% upp. cl. phase cl. phase paration paration cl. phase Viscosity pseudo- easily pseudo- slightly pseudo- plastic plastic viscous plastic Particle 5-10 5-10 ap. 10 10-15 10-15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 4 1 3 7 2 dissol. (s)

Detailed Description Paragraph Table (4):

TABLE C Experiment no. 11 12 13 14 15 Component Composition in % Deionized 40.5 40.5 40.5 40.5 40.5 water Ammonium 27.0 27.0 27.0 27.0 27.0 sulphate Glyphosate, 20.3 20.3 20.3 20.3 98% Plantaren 10.2 225 (11) Plantaren 10.2 600 CS (12) Berol 02 10.2 (13) Berol 922 10.2 (14) Pleuriol 10.2 PE6400 (15) Attagel (5) 2.0 2.0 2.0 2.0 2.0 Total weight 148 148 148 148 148 (g) Density 1.28 1.28 1.28 1.27 1.28 (g/ml) Glyphosate 260 260 260 258 260 (g/l) Amm. 346 346 346 343 346 sulphate (g/l) Evaluation before storage Appearance foaming 15% lower no se- no se- 15% upp. 10% lower cl. phase paration paration cl. phase cl. phase Viscosity pseudo- suffi- clearly pseudo- pseudo- plastic ently pseudo- plastic plastic plastic Particle 10-15

TABLE F Experiment no										Component Composition in % Deionized water					
40.8	40.9	47.2	40.5	Ammonium sulphate	27.2	27.0	27.3	20.3	27.0	Glyphosate,	98%	20.4			
20.3	20.5	20.3	20.3	Marlipal 1618/25 (22)	10.2	Radiasurf 7417 (23)	10.2	Berol OX							
45-11 (21)	10.3	10.2	Berol 533 (24)	10.2	Aerosil R 972 (20)	1.0	Attagel (5)	1.4	2.0						
2.0	2.1	Total weight (g)	147	148	146.5	148	148	Density (g/ml)	1.27	1.28	1.26	1.22			
1.26	Glyphosate (g/l)	345	346	258	248	256	Ammonium sulphate	259	260	344	248	340			
(g/l)	Evaluation before storage	Appearance	no separation	no separation	no separation	no separation	no separation	no separation	no separation	no separation	no separation	no separation			
no separation	no separation	Viscosity	slightly	slightly	pseudo-	pseudo-	pseudo-	pseudo-	pseudo-	pseudo-	pseudo-	pseudo-			
viscous	viscous	plastic	plastic	plastic	plastic	Particle size (.mu.m)	app.	15	app.	15	app.	15			
10 app.	15 app.	15	Oil drops (.mu.m)	n.d.	25-100	25-100	25-100	<25	Evaluation after						

Detailed Description Paragraph Table (8):

Detailed Description Paragraph Table (9):

Detailed Description Paragraph Table (10):

TABLE I Experiment no. 41 42 43 44 45 Component Composition in % Deionized 38.0 38.0 13.6 38.0 22.1 water Ammonium 20.5 32.2 sulfamate Ammonium 25.3 25.3 25.3 sulphate Glyphosate, 19.0 19.0 20.6 19.0 25.0 98% Berol OX 9.5 9.5 10.3 9.5 45-11 (21) Glycerin 6.3 34.3 Propylene 20.7 glycol PEG E200 6.3 (27) Lactic acid 6.3 Attagel (5) 1.9 1.9 0.7 1.9 Total weight 158 158 146 158 140 (g) Density 1.27 1.25 1.30 1.27 1.34 (g/ml) Glyphosate 241 238 268 241 335 (g/l) Elektrolyt 321 316 267 321 431 (g/l) Evaluation before storage Appearance no se- no se- no se- no se- 20% upp. paration paration paration partaion cl. phase Viscosity pseudo- pseudo- pseudo clearly easily plastic plastic plastic pseudo- plastic Particle app. 15 app. 10 app. 15 app. 15 app. 10 size (.mu.m) Oil drops 25-100 >100 n.d. 25-100 n.d. (.mu.m) Evaluation after storage at various temperatures Appearance no se- 10% upp. 10%

lower 5% upp. 35% upp. paration cl. phase cl. phase cl. phase Viscosity
 pseudo- pseudo- pseudo- clearly easily plastic plastic plastic pseudo- plastic
 Particle 10-15 app. 10 app. 15 app. 15 app. 10 size (.mu.m) Oil drops n.d n.d. n.d.
 n.d. n.d. (.mu.m) Speed of 2 2 4 2 3 dissol. (s) Evaluation after storage 14 days at
 55.degree. C. Appearance no se- no se- no se- no se- 25% upp. paration paration
 paration paration cl. phase Viscosity clearly pseudo- pseudo- clearly easily pseudo-
 plastic plastic pseudo- plastic plastic Particle app. 15 5-10 app. 15 app. 15 app.
 10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 8 2 5 2 3
 dissol. (s)

Detailed Description Paragraph Table (11):

TABLE J Experiment no. 46 47 48 49 Component Composition in % Deionized water 38.0
 38.0 40.5 57.6 Ammonium sulphate 25.3 25.3 27.0 14.3 Glyphosate, 98% 19.0 19.0 30.5
 25.2 Berol 02 (13) 6.3 6.3 Hydropar 19 (25) 9.5 Radia 7131 (26) 9.5 Attagel 1.9 1.9
 2.0 2.9 Total weight (g) 158 158 148 139 Density (g/ml) 1.22 1.21 1.34 1.22
Glyphosate (g/l) 232 230 409 174 Ammonium sulphate 309 306 362 307 (g/l) Evaluation
 before storage Appearance 10% lower 15% lower no se- 10% upp. cl. phase cl. phase
 paration cl. phase Viscosity suffici- suffici- pseudo- easily ently ently plastic
 Particle size (.mu.m) app. 20 app. 15 10-15 20-25 Oil drops (.mu.m) >100 25-100 n.d.
 n.d. Evaluation after storage at various temperatures Appearance 30% 2 30% lower 10%
 upp. 10% upp. upp. cl. cl. phase cl. phase cl. phase phases Viscosity suffici-
 pseudo- pseudo- easily ently plastic plastic Particle size (.mu.m) app. 15 10-15
 10-15 20-25 Oil drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 2 2 2 22
 Evaluation after storage 14 days at 55.degree. C. Appearance 15% lower 20% lower no
 se- no se- cl. phase cl. phase paration paration Viscosity suffici- pseudo- pseudo-
 easily ently plastic plastic Particle size (.mu.m) app. 15 app. 15 10-15 20-25 Oil
 drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 4 5 2 4

Detailed Description Paragraph Table (12):

TABLE K Experiment no. 50 51 Component Composition in % Deionized water 42.8 41.7
 Ammonium sulphate 28.6 27.8 Moussex 904 SE (28) 0.7 Ethoquad C/25 (6) 25.0 Berol OX
 45-11 (21) 27.8 Attagel 40 (5) 3.6 2.0 Total weight (g) 140 144 Density (g/ml) 1.15
 1.14 Glyphosate (g/l) -- -- Ammonium sulphate (g/l) 329 317 Evaluation before
 storage Appearance 10% lower 10% lower cl. phase cl. phase Viscosity sufficiently
 sufficiently Particle size (.mu.m) -- -- Oil drops (.mu.m) >100 25-100 Evaluation
 after storage at various temperature Appearance 30% lower 25% lower cl. phase cl.
 phase Viscosity sufficiently sufficiently Particle size (.mu.m) -- -- Oil drops
 (.mu.m) n.d. n.d. Evaluation after storage 14 days at 55.degree. C. Appearance 10%
 lower 5% lower cl. phase cl. phase Viscosity sufficiently sufficiently Particle size
 (.mu.m) -- -- Oil drops (.mu.m) n.d. n.d.

Detailed Description Paragraph Table (15):

TABLE N Experiment no. 59 60 61 62 Component Composition in g Deionized water 60.0
 30.0 30.0 Ammonium sulphate 40.0 20.0 40.0 40.0 Propylene glycol 30.0 30.0 60.0
Glyphosate, 98% 30.0 30.0 30.0 30.0 Genapol OX 130 (30) 20.0 20.0 20.0 20.0
 Viscosity Brook- 1800 3100 -- -- field at 20.degree. C. mPaxs mPaxs

Other Reference Publication (1):

STN International, Chemical Abstracts, vol. 119, No. 9, "Herbicidal glyphosate salt
 concentrate", Aug. 30, 1993.

CLAIMS:

1. A concentrated herbicide suspension composition comprising:

5-58% by weight of a t least one herbicide, said herbicide being in particulate form
 suspended in a liquid aqueous phase and comprising at least one amino group, at
 least one carboxylic acid group and at least one phosphor containing acid group, and

at least 5% by weight of an electrolyte, which is dissolved in the liquid, aqueous
 phase and which is not a surfactant, and

1-5% by weight of one or more surfactants being emulsified, suspended and/or
 dissolved in the liquid, aqueous electrolyte solution.

5. A composition according to claim 1, wherein the herbicide is glyphosate, glufosinate, bilanafos and/or glyphosine.

7. A composition according to claim 1, wherein the herbicide is glyphosate, glufosinate, bilanafos and/or glyphosine in its free, non-neutralized form or completely or partly converted into its respective ammonium salt by reaction with ammonia.

25. An activating additive (adjuvant) in concentrated form for admixture with compositions containing glyphosate- and/or glufosinate for combating weeds, said additive comprising at least one surfactant in an amount of 4-58% by weight being emulsified, suspended and/or dissolved in a liquid, aqueous phase, and at least one undissolved, fine-grained, not biologically active, viscosity regulating filler, said filler acting to prevent the separation of the surfactant and being present in an amount of at least 0.3% by weight, characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of at least 5% by weight.

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L22: Entry 1 of 5

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Drawn Deso	Image								

KMC

☐ 2. Document ID: US 6114464 A

L22: Entry 2 of 5

File: USPT

Sep 5, 2000

US-PAT-NO: 6114464

DOCUMENT-IDENTIFIER: US 6114464 A

TITLE: Thermosetting aqueous compositions

DATE-ISSUED: September 5, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Reck; Bernd	Grunstadt			DE
Wistuba; Eckehardt	Bad Durkheim			DE
Beckerle; Wilhelm Friedrich	Bobenheim-Roxheim			DE
Mohr; Jorgen	Grunstadt			DE
Kistenmacher; Axel	Ludwigshafen			DE
Roser; Joachim	Mannheim			DE

US-CL-CURRENT: 525/329.5; 428/375, 428/537.5, 525/328.2, 525/328.9, 525/329.4,

. 525/329.6, 525/329.9

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☐ 3. Document ID: US 5776876 A

L22: Entry 3 of 5

File: USPT

Jul 7, 1998

US-PAT-NO: 5776876

DOCUMENT-IDENTIFIER: US 5776876 A

TITLE: Aqueous acidic filter cleaning composition for removing organic biguanide deposits

DATE-ISSUED: July 7, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Garris; John P.	Cumming	GA		

US-CL-CURRENT: 510/247; 210/169, 210/749, 210/753, 210/754, 510/199, 510/253,
510/255, 510/269, 510/362, 510/364, 510/365, 510/413, 510/421, 510/432, 510/434

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☐ 4. Document ID: US 4885111 A

L22: Entry 4 of 5

File: USPT

Dec 5, 1989

US-PAT-NO: 4885111

DOCUMENT-IDENTIFIER: US 4885111 A

TITLE: Branched, quaternary polyoxyalkylene copolyesters, a process for their preparation, and their use

DATE-ISSUED: December 5, 1989

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bose; Wllibald	Burgkirchen			DE
Hofinger; Manfred	Burgkirchen			DE
Hille; Martin	Liederbach			DE
Bohm; Roland	Kelkheim			DE
Staiss; Friedrich	Wiesbaden			DE

US-CL-CURRENT: 516/177; 516/179

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☒ 5. Document ID: US 4885110 A

L22: Entry 5 of 5

File: USPT

Dec 5, 1989

US-PAT-NO: 4885110

DOCUMENT-IDENTIFIER: US 4885110 A

TITLE: Branched polyoxyalkylene copolyesters, a process for their preparation, and their use

DATE-ISSUED: December 5, 1989

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bose; Willibald	Burgkirchen			DE
Hofinger; Manfred	Burgkirchen			DE
Hille; Martin	Liederbach			DE
Bohm; Roland	Kelkheim			DE
Staiss; Friedrich	Wiesbaden			DE

US-CL-CURRENT: 516/177; 516/179

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
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L22: Entry 5 of 5

File: USPT

Dec 5, 1989

DOCUMENT-IDENTIFIER: US 4885110 A

TITLE: Branched polyoxyalkylene copolyesters, a process for their preparation, and their use

Abstract Text (1):

Branched polyoxyalkylene copolyesters are described which are prepared by esterifying an oxyalkylated primary fatty amine and an at least trihydric oxyalkylated alkanol or an oxyalkylated polyamine using a dicarboxylic acid or a dicarboxylic anhydride with polycondensation. The novel branched polyoxyalkylene copolyesters are used as demulsifiers for breaking crude oil emulsions.

Brief Summary Text (9):

Through the present invention, novel branched polyoxyalkylene polyesters, to be precise branched, polyoxyalkylene copolyesters, which are particularly effective demulsifiers for crude oil emulsions are prepared. The branched polyoxyalkylene copolyesters according to the invention have been prepared by esterifying an oxyalkylated primary fatty amine of the formula ##STR1## in which

Brief Summary Text (13):

and an at least trihydric alkanol or a polyamine in each case containing 5 to 30, preferably 15 to 25, ethylene oxide units, 5 to 30, preferably 15 to 25, propylene oxide units, or 3 to 20, preferably 5 to 15, ethylene oxide units and 5 to 30, preferably 15 to 25, propylene oxide units per acidic H atom, using a dicarboxylic acid or a dicarboxylic anhydride, with polycondensation, the oxyalkylated fatty amine, the oxyalkylated polyhydric alkanol or the oxyalkylated polyamine, and the dicarboxylic acid or the dicarboxylic anhydride being employed in the molar ratio 1:0.01:0.5 to 1:1:3, preferably 1:0.1:0.9 to 1:0.5:1.5.

Brief Summary Text (14):

Preferred oxyalkylated, primary fatty amines of the abovementioned formula are those where R.^{sup.1} is an alkyl radical having 12 to 18 carbon atoms, R.^{sup.2} is H and a and b are identical or different and are integers or fractions with a total of 2 to 15, taking into account the abovementioned proviso.

Brief Summary Text (15):

Oxyalkylation of primary fatty amines is well known and can be carried out by one of the methods for oxyalkylation of acidic (active) H atom-carrying compounds. According to the meanings of R.^{sup.2}, the oxyalkylated fatty amines can carry units of ethylene oxide or propylene oxide or units of ethylene oxide and propylene oxide arranged in a block, the ethoxylated, i.e. carrying only ethylene oxide units, primary fatty amines being preferred. According to the meanings of R.^{sup.1}, the fatty amines employed for the oxyalkylation can be single primary fatty amines or mixtures thereof. They may also be fatty amines whose hydrocarbon chain contains one or more double bonds, such as the radicals of oleic, elaidic, linolic or linoleic acid. The preferred primary fatty amines are industrially available products, such as stearylamine, coconut acid fatty amine or tallow fatty amine (these industrial products contain alkyl radicals essentially having 12 to 18 carbon atoms).

Brief Summary Text (19):

The dicarboxylic acids to be employed may be aromatic or aliphatic. The aliphatic dicarboxylic acids may be saturated or unsaturated. The aromatic dicarboxylic acid

is preferably phthalic acid (benzene-ortho-dicarboxylic acid). The aliphatic saturated dicarboxylic acid is preferably one having C.sub.1 - to C.sub.8 -alkylene groups, in particular having C.sub.2 - to C.sub.4 -alkylene groups, such as malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid and sebacic acid. The aliphatic unsaturated dicarboxylic acid is preferably fumaric acid or maleic acid. Of the dicarboxylic acids mentioned, the aliphatic saturated dicarboxylic acids and maleic acid are preferred. With respect to the dicarboxylic anhydrides which can be employed in place of the acids, the same applies which has already been stated with respect to the dicarboxylic acids.

Brief Summary Text (20):

The polyoxyalkylene copolyesters according to the invention are prepared by esterifying an oxyalkylated fatty amine of the type mentioned and an oxyalkylated alkanol or an oxyalkylated polyamine of the type mentioned using a dicarboxylic acid or a dicarboxylic anhydride of the type mentioned, the fatty amine, the alkanol or the polyamine and the dicarboxylic acid or dicarboxylic anhydride being employed in the molar ratio 1:0.01:0.5 to 1:1:3, preferably 1:0.1:0.9 to 1:0.5:1.5.

Brief Summary Text (21):

The esterification of the oxyalkylated fatty amines and oxyalkylated polyols or polyamines using a dicarboxylic acid or a dicarboxylic anhydride, which proceeds with polycondensation, is carried out using a higher-boiling, inert solvent, such as toluene or xylene, or without a solvent in the melt, and under cover of a protective gas, the esterification preferably being carried out in the melt. In the case of esterification in a solvent, the reaction temperature selected is expediently the reflux temperature of the reaction mixture and the water of reaction formed is removed by azeotropic distillation. In the case of esterification without a solvent, the water of reaction is discharged (removed by distillation) directly from the reaction mixture. The reaction temperatures here are 140.degree. to 220.degree. C., preferably 160.degree. to 180.degree. C. As is conventional in esterification reactions, an acid catalyst is used to accelerate the reaction. The course and end of the reaction can be checked by means of the water of reaction produced or by determining the amine and acid value. The resultant polyalkylene copolyesters according to the invention are yellow to brown liquids of varying viscosities.

Brief Summary Text (23):

The oxyalkylated fatty amine, the oxyalkylated alkanol or the oxyalkylated polyamine, and the dicarboxylic acid or anhydride, and also an acid catalyst, are introduced into a reaction vessel. Suitable acid catalysts are hydrohalic acids, such as hydrochloric acid or hydrobromic acid, phosphoric acids, such as hypophosphorous acid or orthophosphoric acid, sulfuric acid, sulfonic acids, such as methanesulfonic acid, para-toluenesulfonic acid or dodecylbenzenesulfonic acid, haloacetic acids, such as trichloroacetic acid or trifluoroacetic acid, and mixtures thereof. Hydrochloric acid, phosphoric acid and sulfonic acids are preferred. The amount of acid catalyst is generally 0.05 to 5% by weight, preferably 0.1 to 1% by weight, relative to the total weight of the three reaction components initially introduced. The mixture introduced into the reaction vessel is heated to 140.degree. to 220.degree. C., preferably 160.degree. to 180.degree. C., with stirring and while passing through an inert gas, preferably nitrogen, in order to produce an inert gas atmosphere, and is kept at this temperature (reaction temperature, esterification temperature) until the reaction is complete, while continuously removing the water produced. The course and end of the reaction can be checked by one of the methods described above. The reaction product, which can, if desired, be washed with water in order to remove the catalyst employed, is a yellow to brown liquid of varying viscosity and is the branched polyoxyalkylene copolyester according to the invention. The reaction time is in the range 5 to 30 hours.

Brief Summary Text (24):

The branched polyoxyalkylene copolyesters according to the invention having the three components, namely oxyalkylated, at least trihydric alkanol or oxyalkylated polyamine, oxyalkylated fatty amine and dicarboxylic acid, have specific chemical characteristics and a highly branched structure. They have a viscosity of 2,000 to 50,000 mPa.s, preferably 4,000 to 30,000 mPa.s.

Detailed Description Text (3):

230.0 g (0.35 mol) of a tallow fatty amine containing (on average) 10 mol of ethylene oxide, 58.3 g (0.40 mol) of adipic acid and 650.0 g (0.14 mol) of a glycerol block oxyalkylate containing (on average) per acidic H atom 22.7 mol of propylene oxide as the first block and 5.0 mol of ethylene oxide as the second block, and also 4 ml of 37% strength by weight hydrochloric acid and 1 ml of 50% strength by weight hypophosphorous acid as the esterification catalyst (i.e. 0.20% by weight of hydrochloric acid and 0.10% by weight of hypophosphorous acid, percentages by weight in each case relative to the initial reaction mixture of ethoxylate tallow fatty amine, adipic acid and glycerol block oxyalkylate), were introduced into a 1 liter three-neck flask equipped with stirrer, water separator and internal thermometer. The molar ratio between the reaction components to be reacted, the ethoxylated fatty amine, the glycerol block oxyalkylate and adipic acid was thus 1:0.4:1.14.

Detailed Description Text (18):

Batch: 119.0 g (0.2 mol) of stearylamine containing 8 mol of ethylene oxide, 520.0 g (0.1 mol) of ethylenediamine block oxyalkylate containing (on average) 18.8 mol of propylene oxide as the 1st block and 5.0 mol of ethylene oxide as the 2nd block per acidic H atom, 19.6 g (0.2 mol) of maleic anhydride and 4 ml of 37% strength by weight hydrochloric acid and 1 ml of 50% strength by weight hypophosphorous acid as catalyst. The molar ratio between the reaction components to be employed was thus 1:0.5:1.

Detailed Description Text (21):

Batch: 252.0 g (0.40 mol) of coconut fatty amine containing 10 mol of ethylene oxide, 418.0 g (0.08 mol) of ethylenediamine block oxyalkylate as in Example 6, 73.1 g (0.44 mol) of phthalic acid and 3.4 ml of methanesulfonic acid and 1 ml of 50% strength by weight hypophosphorous acid as catalyst. The molar ratio between the reaction components to be employed was thus 1:0.2:1.1.

Detailed Description Text (26):

Although oxyalkylation of compounds carrying acidic H atoms, such as fatty amines, alkanols and polyamines, has long been well known, the preparation of the oxyalkylated fatty amines, alkanols and oxyalkylated polyamines to be employed according to the invention is nevertheless described here briefly: oxyalkylation of the compounds in question is generally carried out by charging the compound with the oxyalkylating agent, i.e. ethylene oxide and/or propylene oxide, at a temperature of 100.degree. to 150.degree. C. in the presence of a basic catalyst, preferably potassium hydroxide or sodium hydroxide, in an amount of about 0.1 to 5% by weight, relative to the total amount of the compound to be oxyalkylated, the pressure arising from the reaction components at the reaction temperature being produced. The end of the reaction can be detected, for example, from the decreased and constant pressure. If desired, the oxyalkylated compound can be freed from the catalyst, for example by washing with water.

CLAIMS:

1. A branched polyoxyalkylene copolyester, said copolyester having been prepared by esterifying an OH-containing component and a dicarboxylic component in the presence of a mineral acid or carboxylic acid esterification catalyst while removing the water of reaction, the esterification reaction being carried out in the melt at a temperature of 160.degree. to 180.degree. C., said OH-containing component consisting essentially of:

an oxyalkylated primary fatty amine of formula ##STR2## in which R.^{sup.1} is an alkyl radical or alkylene radical having 8 to 23 carbon atoms;

R.^{sup.2} is H, in which case the polyoxyalkylene radicals of Formula I are polyoxyethylene, or R.^{sup.2} is CH._{sub.3}, in which case the polyoxyalkylene radicals of formula I are polyoxypropylene, or R.^{sup.2} is both H and CH._{sub.3}, in which case the polyoxyalkylene radicals of Formula I are the same or different and can carry blockwise-arranged units of ethylene oxide and propylene oxide; and a and b are identical or different and are integers or fractions with a total of 2 to 30, with the proviso that neither a nor b is zero; and

an alkoxyalkylated polyhydric alkanol having 3 to 6 OH groups or an alkoxyalkylated, at least trifunctional polyamine, which in each case contains 5 to 30 ethylene oxide units, 5 to 30 propylene oxide units, or 3 to 20 ethylene oxide units and 5 to 30 propylene oxide units per acid H atom, said dicarboxylic component consisting essentially of a dicarboxylic acid or a dianhydride thereof, said dicarboxylic acid being malonic, succinic, glutaric, adipic, pimelic, suberic, azelaic, sebacic, fumaric, maleic, or phthalic acid;

the oxyalkylated primary fatty amine, the alkoxyalkylated polyhydric-alkanol or polyamine reactant, and the dicarboxylic component being employed in the molar ratio 1:0.01:0.5 to 1:1:3.

2. A branched polyoxyalkylene copolyester as claimed in claim 1, wherein the trihydric alkanol and the polyamine contain 15 to 25 ethylene oxide units, 15 to 25 propylene oxide units, or 5 to 15 ethylene oxide units and 15 to 25 propylene oxide units per acidic H atom, the alkanol being glycerol, erythritol, pentaerythritol, trimethylolpropane, 1,3,5-hexanetriol, a pentitol or a hexitol, and the polyamine being ethylenediamine, diethylenetriamine, triethylenetetramine, tetraethylenepentamine, pentaethylenhexamine or a corresponding propylenepolyamine, and wherein the dicarboxylic acid is malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, fumaric acid, maleic acid or phthalic acid, and the dicarboxylic anhydride is an anhydride of the dicarboxylic acids mentioned.

3. A branched polyoxyalkylene copolyester as claimed in claim 1, wherein the trihydric alkanol and the polyamine contain 15 to 25 ethylene oxide units, 15 to 25 propylene oxide units, or 5 to 15 ethylene oxide units and 15 to 25 propylene oxide units per acidic H atom, the alkanol being glycerol, pentaerythritol or trimethylolpropane, and the polyamine being ethylenediamine, diethylenetriamine, triethylenetetramine, tetraethylenepentamine or a corresponding propylene-polyamine, and wherein the dicarboxylic acid is succinic acid, glutaric acid, adipic acid, maleic acid or phthalic acid, and the dicarboxylic anhydride is an anhydride of the dicarboxylic acids mentioned.

4. A branched polyoxyalkylene copolyester as claimed in claim 1, wherein the oxyalkylated fatty amine employed is one which arises when R^{sup.1} is an alkyl radical having 12 to 18 carbon atoms, R^{sup.2} is H, and a and b are identical or different and are integers or fractions with a total of 2 to 15, the oxyalkylated trihydric alkanol is glycerol, pentaerythritol or trimethylolpropane containing a first block made from 15 to 25 propylene oxide units and a subsequent block made from 5 to 15 ethylene oxide units, the oxyalkylated polyamine is ethylenediamine, diethylenetriamine, triethylenetetramine, tetraethylenepentamine or a corresponding propylene polyamine containing a first block made from 15 to 25 propylene oxide units and a subsequent block made from 5 to 15 ethylene oxide units, and the dicarboxylic acid or dicarboxylic anhydride is succinic acid, glutaric acid, adipic acid, maleic acid or phthalic acid or an anhydride of these dicarboxylic acids.

6. A polyoxyalkylene copolyester as claimed in claim 1, wherein said OH-containing component consists essentially of the oxyalkylated primary fatty amine and an alkoxyalkylated polyhydric alkanol having 3 to 6 OH groups.

8. A polyoxyalkylene copolyester as claimed in claim 7, wherein said copolyester is obtained from said oxyalkylated primary fatty amine, said alkoxyalkylated polyhydric alkanol, and the dicarboxylic component.

9. A polyoxyalkylene copolyester as claimed in claim 7, wherein the molar ratio of oxyalkylated primary fatty amine to alkoxyalkylated polyhydric alkanol to dicarboxylic component is 1:0.1:0.9 to 1:0.5:1.5.

10. A polyoxyalkylene copolyester as claimed in claim 6, wherein the molar ratio of oxyalkylated primary fatty amine to alkoxyalkylated polyhydric alkanol to dicarboxylic acid component is 1:0.1:0.9 to 1:0.5:1.5.

11. A polyoxyalkylene copolyester as claimed in claim 6, wherein the esterification catalyst is a hydrohalic acid, a phosphoric acid, sulfuric acid, a sulfonic acid, a

" " " "

. haloacetic acid, or a mixture thereof.

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L23: Entry 1 of 1

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KWC

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L26: Entry 1 of 2

File: PGPB

Oct 31, 2002

PGPUB-DOCUMENT-NUMBER: 20020160916

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020160916 A1

TITLE: Agricultural formulation

PUBLICATION-DATE: October 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Volgas, Greg	Bartlett	TN	US	
Roberts, Johnnie R.	Memphis	TN	US	
Hayes, Amanda	Memphis	TN	US	

US-CL-CURRENT: [504/194](#); [504/195](#), [504/196](#), [504/197](#), [504/198](#), [504/362](#), [504/363](#),
[504/364](#), [504/365](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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[KWC](#)☐ 2. Document ID: US 20020123430 A1

L26: Entry 2 of 2

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: [504/206](#); [504/363](#)

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L27: Entry 1 of 1

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KMC

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L28: Entry 1 of 3

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002.

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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[KMC](#)☐ 2. Document ID: US 5776876 A

L28: Entry 2 of 3

File: USPT

Jul 7, 1998

US-PAT-NO: 5776876

DOCUMENT-IDENTIFIER: US 5776876 A

TITLE: Aqueous acidic filter cleaning composition for removing organic biguanide deposits

DATE-ISSUED: July 7, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Garris, John P.	Cumming	GA		

US-CL-CURRENT: 510/247; 210/169, 210/749, 210/753, 210/754, 510/199, 510/253, 510/255, 510/269, 510/362, 510/364, 510/365, 510/413, 510/421, 510/432, 510/434

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Drawn Desc	Image								

[KMC](#)

☐ 3. Document ID: US 4885111 A

L28: Entry 3 of 3

File: USPT

Dec 5, 1989

US-PAT-NO: 4885111

DOCUMENT-IDENTIFIER: US 4885111 A

TITLE: Branched, quaternary polyoxyalkylene copolyesters, a process for their preparation, and their use

DATE-ISSUED: December 5, 1989

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bose; Wllibald	Burgkirchen			DE
Hofinger; Manfred	Burgkirchen			DE
Hille; Martin	Liederbach			DE
Bohm; Roland	Kelkheim			DE
Staiss; Friedrich	Wiesbaden			DE

US-CL-CURRENT: 516/177; 516/179

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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L34: Entry 1 of 2

File: PGPB

Nov 21, 2002

PGPUB-DOCUMENT-NUMBER: 20020173423

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020173423 A1

TITLE: Ammonium glyphosate compositions and process for their preparation

PUBLICATION-DATE: November 21, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Massmann, Brent D.	Ballwin	MO	US	
Wang, John T.	St. Louis	MO	US	
Campbell, Dwane H.	Wildwood	MO	US	

US-CL-CURRENT: 504/106

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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[KMC](#)☐ 2. Document ID: US 20020123430 A1

L34: Entry 2 of 2

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

☐ 3. Document ID: US 20020123430 A1

L37: Entry 3 of 53

File: PGPB

Sep 5, 2002

PGPUB-DOCUMENT-NUMBER: 20020123430
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020123430 A1

TITLE: Pesticide compositions containing oxalic acid

PUBLICATION-DATE: September 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Xu, Xiaodong C.	Valley Park	MO	US	
Brinker, Ronald J.	Ellisville	MO	US	
Reynolds, Tracey L.	Ballwin	MO	US	
Abraham, William	Wildwood	MO	US	
Graham, Jeffrey A.	Wildwood	MO	US	

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 4. Document ID: US 20020107149 A1

L37: Entry 4 of 53

File: PGPB

Aug 8, 2002

PGPUB-DOCUMENT-NUMBER: 20020107149
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20020107149 A1

TITLE: Manufacture and use of a herbicide formulation

PUBLICATION-DATE: August 8, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Volgas, Greg	Bartlett	TN	US	
Roberts, Johnnie R.	Memphis	TN	US	
Johnson, Flavious	Memphis	TN	US	

US-CL-CURRENT: 504/317; 504/244, 504/318, 504/323, 504/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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RMC

☐ 5. Document ID: US 20020058244 A1

L37: Entry 5 of 53

File: PGPB

May 16, 2002

PGPUB-DOCUMENT-NUMBER: 20020058244
PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020058244 A1

TITLE: Method for detecting uracil biosynthesis inhibitors and their use as herbicides

PUBLICATION-DATE: May 16, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Pedersen, Marianne K.	Princeton Junction	NJ	US	
Birk, Iwona T.	Raleigh	NC	US	
Orth, Ann B.	Langhorne	PA	US	
Singh, Bijay K.	Apex	NC	US	
Tecle, Berhane	Lawrenceville	NJ	US	
Kameswaran, Venkataraman	Pennington	NJ	US	
Szucs, Stephen S.	Lawrenceville	NJ	US	

US-CL-CURRENT: 435/4; 504/116.1, 504/282, 548/370.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 6. Document ID: US 20020049140 A1

L37: Entry 6 of 53

File: PGPB

Apr 25, 2002

PGPUB-DOCUMENT-NUMBER: 20020049140

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020049140 A1

TITLE: Solid glyphosate-formulation and manufacturing process

PUBLICATION-DATE: April 25, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Hamroll, Bernd	Magdeburg		DE	
Dittrich, Gunter	Magdeburg		DE	
Muller, Bernd	Magdeburg		DE	

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 7. Document ID: US 20020039970 A1

L37: Entry 7 of 53

File: PGPB

Apr 4, 2002

PGPUB-DOCUMENT-NUMBER: 20020039970

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020039970 A1

TITLE: Manufacture and use of a herbicide formulation

PUBLICATION-DATE: April 4, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Roberts, Johnnie R.	Memphis	TN	US	
Volgas, Gregory C.	Bartlett	TN	US	
Thomas, James	Cordova	TN	US	

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☐ 8. Document ID: US 20010019996 A1

L37: Entry 8 of 53

File: PGPB

Sep 6, 2001

PGPUB-DOCUMENT-NUMBER: 20010019996

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010019996 A1

TITLE: PROCESS AND COMPOSITIONS PROMOTING BIOLOGICAL EFFECTIVENESS OF EXOGENOUS CHEMICAL SUBSTANCES IN PLANTS

PUBLICATION-DATE: September 6, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
SOULA, GERARD G.	MEYZIEUX	MO	FR	
MEYRUEIX, REMI	LYON	MO	FR	
LEMERCIER, ALAIN J.L.	ST. BONNET DE MURE	MO	FR	
CAISSE, PHILIPPE G.	SAINT BONNET DE MURE		FR	
WARD, ANTHONY J.I.	CLAYTON		US	
GILLESPIE, JANE L.	ST. LOUIS		US	
BRINKER, RONALD J.	ELLISVILLE		US	

US-CL-CURRENT: 504/189, 424/405, 504/194, 504/199, 514/553, 514/661, 514/740

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 9. Document ID: US 6500783 B1

L37: Entry 9 of 53

File: USPT

Dec 31, 2002

US-PAT-NO: 6500783

DOCUMENT-IDENTIFIER: US 6500783 B1

TITLE: Process and compositions promoting biological effectiveness of exogenous chemical substances in plants

DATE-ISSUED: December 31, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bryson; Nathan J.	Millery			FR
Soula; Olivier	Lyon			FR
Lemercier; Alain J. L.	St. Bonnet de Mure			FR
Meyrueix; Remi	Lyon			FR
Soula; Gerard G.	Meyzieux			FR

US-CL-CURRENT: 504/206; 504/362

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 10. Document ID: US 6475954 B2

L37: Entry 10 of 53

File: USPT

Nov 5, 2002

US-PAT-NO: 6475954

DOCUMENT-IDENTIFIER: US 6475954 B2

TITLE: Solid glyphosphate-formulation and manufacturing process

DATE-ISSUED: November 5, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hamroll; Bernd	Magdeburg			DE
Dittrich; Gunter	Magdeburg			DE
Muller; Bernd	Magdeburg			DE

US-CL-CURRENT: 504/206; 504/127

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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WEST[Generate Collection](#)[Print](#)**Search Results - Record(s) 11 through 20 of 53 returned.**☐ 11. Document ID: US 6468944 B1

L37: Entry 11 of 53

File: USPT

Oct 22, 2002

US-PAT-NO: 6468944

DOCUMENT-IDENTIFIER: US 6468944 B1

TITLE: Method of preparing glyphosate herbicide formulations

DATE-ISSUED: October 22, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bugg; M. Wayne	Ellisville	MO	63011	
Arnold; Kristin A.	Kirkwood	MO	63122	
White; Randall J.	Miamisburg	OH	45342	

US-CL-CURRENT: 504/127; 504/142, 504/206, 504/320, 504/358

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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[KMC](#)☐ 12. Document ID: US 6458745 B1

L37: Entry 12 of 53

File: USPT

Oct 1, 2002

US-PAT-NO: 6458745

DOCUMENT-IDENTIFIER: US 6458745 B1

TITLE: Solid phytosanitary agent

DATE-ISSUED: October 1, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Runge; Frank	Maxdorf			DE
Zwissler; Georg Konrad	Bad Durkheim			DE
Horn; Dieter	Heidelberg			DE
End; Lutz	Mannheim			DE
Kober; Reiner	Fussgonheim			DE
Schneider; Karl-Heinrich	Kleinkarlbach			DE
Stadler; Reinhold	Kirrweiler			DE
Ziegler; Hans	Mutterstadt			DE
Rademacher; Wilhelm	Limburgerhof			DE
Schmidt; Oskar	Schifferstadt			DE
Harries; Volker	Frankenthal			DE
Saur; Reinhold	Bohl-Iggelheim			DE

US-CL-CURRENT: [504/359](#); [424/405](#), [504/118](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMCD
Draw Desc	Image									

☒ 13. Document ID: US 6432878 B1

L37: Entry 13 of 53

File: USPT

Aug 13, 2002

US-PAT-NO: 6432878

DOCUMENT-IDENTIFIER: US 6432878 B1

TITLE: Adjuvant composition

DATE-ISSUED: August 13, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Brigance; Mickey R.	Germantown	TN		

US-CL-CURRENT: [504/206](#); [504/362](#), [514/772](#), [514/784](#), [514/975](#), [516/203](#), [516/204](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMCD
Draw Desc	Image									

☐ 14. Document ID: US 6380135 B1

L37: Entry 14 of 53

File: USPT

Apr 30, 2002

US-PAT-NO: 6380135

DOCUMENT-IDENTIFIER: US 6380135 B1

TITLE: Agrochemical compositions

DATE-ISSUED: April 30, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Reuter; Karl	Freiburg			DE
Krueger; Christian	Grenzach-Wyhlen			DE

US-CL-CURRENT: 504/366; 504/367, 514/944, 514/951, 514/952

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
Draw Desc	Image									

☒ 15. Document ID: US 6365551 B1

L37: Entry 15 of 53

File: USPT

Apr 2, 2002

US-PAT-NO: 6365551

DOCUMENT-IDENTIFIER: US 6365551 B1

TITLE: Highly concentrated glyphosate herbicidal compositions

DATE-ISSUED: April 2, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Wright; Daniel R.	St. Louis	MO		
Forbes; James C.	Glenview	IL		
Berger; Paul D.	Sugarland	TX		
Jimenez; Antonio M.	Missouri	TX		

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☐ 16. Document ID: US 6342466 B1

L37: Entry 16 of 53

File: USPT

Jan 29, 2002

US-PAT-NO: 6342466

DOCUMENT-IDENTIFIER: US 6342466 B1

TITLE: Biodegradable solutions of biologically active compounds

DATE-ISSUED: January 29, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Dookhith; Mohammad	Charlotte	NC		
Zerrer; Ralf	Karlstein			DE
Weinelt; Frank	Burgkirchen			DE
Scherl; Franz	Burgkirchen			DE

US-CL-CURRENT: 504/362; 504/363, 504/367, 514/772, 514/937, 514/952

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☒ 17. Document ID: US 6329322 B1

L37: Entry 17 of 53

File: USPT

Dec 11, 2001

US-PAT-NO: 6329322

DOCUMENT-IDENTIFIER: US 6329322 B1

TITLE: Hybrid ionic phosphorus surfactant adjuvants for bioactive compositions

DATE-ISSUED: December 11, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Reiersen; Robert Lee	West Windsor	NJ		

US-CL-CURRENT: 504/206; 504/365, 514/937

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 18. Document ID: US 6228807 B1

L37: Entry 18 of 53

File: USPT

May 8, 2001

US-PAT-NO: 6228807

DOCUMENT-IDENTIFIER: US 6228807 B1

TITLE: Glyphosate formulations

DATE-ISSUED: May 8, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kuchikata; Masuo	Ibaraki			JP
Prill; Erhard J.	Kirkwood	MO		
Richardson; Ronald O.	Ellisville	MO		
Sato; Tatsuo	Tokyo			JP
Surgant; John M.	Clayton	MO		
Wright; Daniel R.	St. Louis	MO		

US-CL-CURRENT: 504/206; 504/366, 504/367

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 19. Document ID: US 6225259 B1

L37: Entry 19 of 53

File: USPT

May 1, 2001

US-PAT-NO: 6225259

DOCUMENT-IDENTIFIER: US 6225259 B1

TITLE: Liquid formulation of
ethyl-(Z)-2-chloro-3-[2-chloro-5-(4,5,6,7-tetrahydro-1,3-dioxoisindole-2-yl)phenyl]acrylate

DATE-ISSUED: May 1, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Berghaus; Rainer	67346 Speyer			DE
Kleuser; Dieter	67227 Frankenthal			DE
Bratz; Matthias	67117 Limburgerhof			DE
Parg; Adolf	67098 Bad Dürkheim			DE
Nuyken; Wessel	67166 Otterstadt			DE

US-CL-CURRENT: [504/138](#); [504/286](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 20. Document ID: US 6180566 B1

L37: Entry 20 of 53

File: USPT

Jan 30, 2001

US-PAT-NO: 6180566

DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive
for application therewith

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.l; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: [504/206](#); [504/363](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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L37: Entry 21 of 53

File: USPT

Dec 12, 2000

US-PAT-NO: 6159900

DOCUMENT-IDENTIFIER: US 6159900 A

TITLE: Synergistic herbicidal agents

DATE-ISSUED: December 12, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bieringer; Hermann	Eppstein/Taunus			DE
Hacker; Erwin	Hochheim am Main			DE
Heinrich; Rudolf	Kelkheim/Taunus			DE
Huff; Hans-Philipp	Eppstein/Taunus			DE
Kocur; Jean	Hofheim am Taunus			DE

US-CL-CURRENT: [504/206](#); [504/235](#), [504/250](#), [504/363](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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[KIMC](#)☒ 22. Document ID: US 6121200 A

L37: Entry 22 of 53

File: USPT

Sep 19, 2000

US-PAT-NO: 6121200

DOCUMENT-IDENTIFIER: US 6121200 A

TITLE: Compositions of polyoxyalkylene alkylamine surfactants having reduced eye irritation

DATE-ISSUED: September 19, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Berger; Paul D.	Missouri	TX		
Jimenez; Antonio M.	Missouri	TX		

US-CL-CURRENT: [504/206](#); [504/362](#), [516/199](#), [516/203](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 25. Document ID: US 6063733 A

L37: Entry 25 of 53

File: USPT

May 16, 2000

US-PAT-NO: 6063733

DOCUMENT-IDENTIFIER: US 6063733 A

TITLE: Pesticidal compositions of polyoxyalkylene alkylamine surfactants having reduced eye irritation

DATE-ISSUED: May 16, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Berger; Paul D.	Sugar Land	TX		
Jimenez; Antonio M.	Missouri	TX		

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☐ 26. Document ID: US 6051533 A

L37: Entry 26 of 53

File: USPT

Apr 18, 2000

US-PAT-NO: 6051533

DOCUMENT-IDENTIFIER: US 6051533 A

TITLE: Formulations having enhanced water dissolution

DATE-ISSUED: April 18, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kajikawa; Akira	Ibaraki			JP
Kuchikata; Masuo	Ibaraki			JP
Richardson; Ronald O.	Ellisville	MO		
Sato; Tatsuo	Tokyo			JP

US-CL-CURRENT: 504/206; 504/360

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☐ 27. Document ID: US 6020287 A

L37: Entry 27 of 53

File: USPT

Feb 1, 2000

US-PAT-NO: 6020287

DOCUMENT-IDENTIFIER: US 6020287 A

TITLE: Process and compositions for enhancing reliability of exogenous chemical

substances applied to plants

DATE-ISSUED: February 1, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Brinker; Ronald Joseph	Ellisville	MO		
Gillespie; Jane Laura	St. Louis	MO		
Raymond; Peter Joseph	Wildwood	MO		
Sandbrink; Joseph Jude	Des Peres	MO		
Warner; James Michael	Webster Groves	MO		
Wideman; Al Steven	St. Louis	MO		
Wright; Daniel Richard	St. Louis	MO		

US-CL-CURRENT: 504/362; 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 28. Document ID: US 5994269 A

L37: Entry 28 of 53

File: USPT

Nov 30, 1999

US-PAT-NO: 5994269

DOCUMENT-IDENTIFIER: US 5994269 A

TITLE: Method of preparing glyphosate herbicide formulations

DATE-ISSUED: November 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bugg; M. Wayne	Ellisville	MO		
Arnold; Kristin A.	Kirkwood	MO		
White; Randall J.	Miamisburg	OH		

US-CL-CURRENT: 504/127; 504/142, 504/206, 504/320, 504/362

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 29. Document ID: US 5985793 A

L37: Entry 29 of 53

File: USPT

Nov 16, 1999

US-PAT-NO: 5985793

DOCUMENT-IDENTIFIER: US 5985793 A

TITLE: Sequential application method for treating plants with exogenous chemicals

DATE-ISSUED: November 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sandbrink; Joseph J.	Des Peres	MO		
Warner; James M.	University City	MO		
Wright; Daniel R.	St. Louis	MO		
Feng; Paul C. C.	Ellisville	MO		

US-CL-CURRENT: [504/363](#); [424/405](#), [504/206](#), [504/208](#), [504/212](#), [504/250](#), [504/253](#),
[504/258](#), [504/274](#), [504/291](#), [504/323](#), [504/324](#), [504/339](#), [504/342](#), [504/347](#), [504/352](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☒ 30. Document ID: US 5877112 A

L37: Entry 30 of 53

File: USPT

Mar 2, 1999

US-PAT-NO: 5877112

DOCUMENT-IDENTIFIER: US 5877112 A

TITLE: Agricultural formulation

DATE-ISSUED: March 2, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Roberts; Johnnie R.	Memphis	TN		
Volgas; Greg	Bartlett	TN		

US-CL-CURRENT: [504/206](#); [504/232](#), [504/323](#), [504/365](#), [516/57](#), [516/908](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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L37: Entry 31 of 53

File: USPT

Feb 16, 1999

US-PAT-NO: 5872078

DOCUMENT-IDENTIFIER: US 5872078 A

TITLE: Glyphosate formulations

DATE-ISSUED: February 16, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kuchikata; Masuo	Ibaraki			JP
Prill; Erhard J.	Kirkwood	MO		
Richardson; Ronald O.	Ellisville	MO		
Sato; Tatsuo	Tokyo			JP
Surgant; John M.	Clayton	MO		
Wright; Daniel R.	St. Louis	MO		

US-CL-CURRENT: 504/206; 504/127, 504/128, 504/135, 504/137, 504/144, 504/146

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
Draw Desc	Image									

☐ 32. Document ID: US 5821195 A

L37: Entry 32 of 53

File: USPT

Oct 13, 1998

US-PAT-NO: 5821195

DOCUMENT-IDENTIFIER: US 5821195 A

TITLE: Sequential application method for enhancing glyphosate herbicidal effectiveness with reduced antagonism

DATE-ISSUED: October 13, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sandbrink; Joseph J.	Des Peres	MO		
Warner; James M.	University City	MO		
Wright; Daniel R.	St. Louis	MO		
Feng; Paul C. C.	Ellisville	MO		

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

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☐ 33. Document ID: US 5795847 A

L37: Entry 33 of 53

File: USPT

Aug 18, 1998

US-PAT-NO: 5795847

DOCUMENT-IDENTIFIER: US 5795847 A

TITLE: Herbicide preparation; a process for producing it and an activating additive for application therewith

DATE-ISSUED: August 18, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.1; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 34. Document ID: US 5703015 A

L37: Entry 34 of 53

File: USPT

Dec 30, 1997

US-PAT-NO: 5703015

DOCUMENT-IDENTIFIER: US 5703015 A

TITLE: Pesticidal compositions of polyoxyalkylene alkylamine surfactants having reduced eye irritation

DATE-ISSUED: December 30, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Berger; Paul D.	Sugar Land	TX		
Jimenez; Antonio M.	Missouri	TX		

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
Draw Desc	Image								

KIMC

☐ 35. Document ID: US 5683958 A

L37: Entry 35 of 53

File: USPT

Nov 4, 1997

US-PAT-NO: 5683958

DOCUMENT-IDENTIFIER: US 5683958 A

TITLE: Surfactants mixtures

DATE-ISSUED: November 4, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Berger; Paul D.	Sugar Land	TX		
Jimenez; Antonio M.	Missouri	TX		

US-CL-CURRENT: 504/364; 504/365, 516/201, 516/916, 516/DIG.5, 516/DIG.7

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
Draw. Desc	Image									

☐ 36. Document ID: US 5656572 A

L37: Entry 36 of 53

File: USPT

Aug 12, 1997

US-PAT-NO: 5656572

DOCUMENT-IDENTIFIER: US 5656572 A

TITLE: Method of controlling weeds

DATE-ISSUED: August 12, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kuchikata; Masuo	Ibaraki			JP
Prill; Erhard J.	Kirkwood	MO		
Richardson; Ronald O.	Ellisville	MO		
Sato; Tatsuo	Tokyo			JP
Surgant; John M.	Clayton	MO		
Wright; Daniel R.	St. Louis	MO		

US-CL-CURRENT: 504/206; 504/362, 504/367

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
Draw. Desc	Image									

☐ 37. Document ID: US 5565409 A

L37: Entry 37 of 53

File: USPT

Oct 15, 1996

US-PAT-NO: 5565409

DOCUMENT-IDENTIFIER: US 5565409 A

TITLE: Liquid concentrated herbicidal microemulsion compositions comprising glyphosate and either oxyfluorfen or acifluorfen

DATE-ISSUED: October 15, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sato; Tatsuo	Tokyo			JP
Khan; Shuaib A.	Brussels			BE
Mitchell; Robert W.	Overijse			BE

US-CL-CURRENT: 504/127; 504/365

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
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☐ 38. Document ID: US 5543562 A

L37: Entry 38 of 53

File: USPT

Aug 6, 1996

US-PAT-NO: 5543562

DOCUMENT-IDENTIFIER: US 5543562 A

TITLE: Non-hygroscopic monoammonium salts of phosphonic acids or phosphinic acids

DATE-ISSUED: August 6, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Moreno; Fulgencio Powell	Tiszavasvari			HU
Litkei; Laszlo	Tiszavasvari			HU
Galamb; Vilmos	Tiszavasvari			HU
Gulyas; Imre	Tiszavasvari			HU
Repasi; Jan os	Tiszavasvari			HU
Veres; Agota Repasine	Tiszavasvari			HU
Vigh; Jozsef	Tiszavasvari			HU
Koczka; Istvanne	Tiszavasvari			HU
Fehervari; Edit	Tiszavasvari			HU
Roka; Laszlone	Tiszavasvari			HU
Pethe; Laszlone	Tiszavasvari			HU
Neu; Jozsef	Tiszavasvari			HU

US-CL-CURRENT: 562/17; 504/127, 504/206, 562/16, 562/8

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
Draw Desc	Image									

☐ 39. Document ID: US 5410075 A

L37: Entry 39 of 53

File: USPT

Apr 25, 1995

US-PAT-NO: 5410075

DOCUMENT-IDENTIFIER: US 5410075 A

TITLE: Non-hygroscopic monoammonium salts of phosphonic and phosphinic acids

DATE-ISSUED: April 25, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Powell Moreno; Fulgencio	Tiszavasvari			HU
Litkei; Laszlo	Tiszavasvari			HU
Galamb; Vilmos	Tiszavasvari			HU
Gulyas; Imre	Tiszavasvari			HU
Repasi; Janos	Tiszavasvari			HU
Repasine Veres; Agota	Tiszavasvari			HU
Vigh; Jozsef	Tiszavasvari			HU
Koczka; Istvanne	Tiszavasvari			HU
Fehervari; Edit	Tiszavasvari			HU
Roka; Laszlonge	Tiszavasvari			HU
Pethe; Laszlonge	Tiszavasvari			HU
Neu; Jozsef	Tiszavasvari			HU

US-CL-CURRENT: 562/17; 504/127, 504/206, 562/16, 562/8

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
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☐ 40. Document ID: US 5409885 A

L37: Entry 40 of 53

File: USPT

Apr 25, 1995

US-PAT-NO: 5409885

DOCUMENT-IDENTIFIER: US 5409885 A

TITLE: Homogeneous, stable and flowable aqueous mixtures and dispersions of water-insoluble substances formulated therefrom exhibiting optical birefringence

DATE-ISSUED: April 25, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Derian; Paul-Joel	Fontenay-Aux-Roses			FR
Guerin; Gilles	Eaubonne			FR
Jost; Philippe	Paris			FR

US-CL-CURRENT: 504/257; 504/323, 504/362, 504/364, 514/143, 514/385, 514/417, 514/471, 514/521, 514/755, 514/937

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KWIC
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L37: Entry 41 of 53

File: USPT

Jun 28, 1994

US-PAT-NO: 5324708

DOCUMENT-IDENTIFIER: US 5324708 A

TITLE: Non-hygroscopic monoammonium salts of phosphonic and phosphinic acids

DATE-ISSUED: June 28, 1994

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Moreno; Fulgencio P.	Tiszavasvari			HU
Litkei; Laszlo	Tiszavasvari			HU
Galamb; Vilmos	Tiszavasvari			HU
Gulyas; Imre	Tiszavasvari			HU
Repasi; Janos	Tiszavasvari			HU
Veres; Agota R.	Tiszavasvari			HU
Vigh; Jozsef	Tiszavasvari			HU
Koczka; Istavanne	Tiszavasvari			HU
Fehervari; Edit	Tiszavasvari			HU
Roka; Laszlonge	Tiszavasvari			HU
Pethe; Laszlonge	Tiszavasvari			HU
Neu; Jozsef	Tiszavasvari			HU

US-CL-CURRENT: 504/206; 504/127, 562/16, 562/17, 562/8

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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[KWD](#)☐ 42. Document ID: US 5118444 A

L37: Entry 42 of 53

File: USPT

Jun 2, 1992

US-PAT-NO: 5118444

DOCUMENT-IDENTIFIER: US 5118444 A

TITLE: Aqueous agricultural compositions exhibiting reduced irritation and corrosion

DATE-ISSUED: June 2, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nguyen; Giao V.	Lewisville	TX		

US-CL-CURRENT: [252/390](#); [252/387](#), [252/392](#), [424/727](#), [424/757](#), [504/365](#), [71/DIG.4](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☒ 43. Document ID: US 4557751 A

L37: Entry 43 of 53

File: USPT

Dec 10, 1985

US-PAT-NO: 4557751

DOCUMENT-IDENTIFIER: US 4557751 A

TITLE: Compositions containing surfactant and broadleaf foliar herbicide

DATE-ISSUED: December 10, 1985

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ronning; Patricia M.	St. Paul	MN		
Vandesteeg; Gregg A.	St. Paul	MN		

US-CL-CURRENT: [504/222](#); [504/231](#), [504/321](#), [504/323](#), [504/332](#), [504/333](#), [504/363](#),
[504/365](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
Draw Desc	Image									

☐ 44. Document ID: US 4501605 A

L37: Entry 44 of 53

File: USPT

Feb 26, 1985

US-PAT-NO: 4501605

DOCUMENT-IDENTIFIER: US 4501605 A

TITLE: Herbicidal heterocyclic compounds and compositions

DATE-ISSUED: February 26, 1985

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hough; Thomas L.	Linton			GB2
Jones; Graham P.	Babraham			GB2

US-CL-CURRENT: [504/217](#); [546/140](#)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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☐ 45. Document ID: US 4399287 A

L37: Entry 45 of 53

File: USPT

Aug 16, 1983

US-PAT-NO: 4399287

DOCUMENT-IDENTIFIER: US 4399287 A

TITLE: Phosphinic acid derivatives

DATE-ISSUED: August 16, 1983

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Baillie; Alister C.	Bottisham			GB2
Wright; Brian J.	Bishops Stortford			GB2
Wright; Kenneth	Lode			GB2
Earnshaw; Christopher G.	Chesterton			GB2

US-CL-CURRENT: 548/119; 504/175, 504/195, 504/197, 504/201, 504/202, 504/203,
504/204, 504/205, 504/206, 504/207, 504/208, 558/168, 558/169, 558/170, 558/175,
558/179, 558/182, 558/231, 558/300, 558/386, 560/179, 987/178, 987/180, 987/185,
987/186, 987/63

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
Draw Desc	Image									

☐ 46. Document ID: US 4333759 A

L37: Entry 46 of 53

File: USPT

Jun 8, 1982

US-PAT-NO: 4333759

DOCUMENT-IDENTIFIER: US 4333759 A

TITLE: Herbicidal 5-cyano-2,3-dihydro-benzofuran-2-ones

DATE-ISSUED: June 8, 1982

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gates; Peter S.	Cambridge			GB2
Baldwin; Derek	Cambridge			GB2
Wilson; Carol A.	Saffron Walden			GB2
Gillon; John	Cambridge			GB2

US-CL-CURRENT: 504/298; 549/345, 549/466

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☐ 47. Document ID: US 4263037 A

L37: Entry 47 of 53

File: USPT

Apr 21, 1981

US-PAT-NO: 4263037

DOCUMENT-IDENTIFIER: US 4263037 A

TITLE: 5-Cyano-2,3-dihydrobenzofurans useful as herbicides

DATE-ISSUED: April 21, 1981

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gates; Peter S.	Cambridge			GB2
Baldwin; Derek	Cambridge			GB2
Wilson; Carol A.	Saffron Walden			GB2
Gillon; John	Cambridge			GB2

US-CL-CURRENT: 504/140; 504/298, 544/163, 546/196, 548/407, 548/525, 549/10,
549/228, 549/350, 549/466, 549/467, 549/469 , 558/419, 558/423

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☐ 48. Document ID: US 4222767 A

L37: Entry 48 of 53

File: USPT

Sep 16, 1980

US-PAT-NO: 4222767

DOCUMENT-IDENTIFIER: US 4222767 A

TITLE: Certain herbicidal sulfonates and sulfamates

DATE-ISSUED: September 16, 1980

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Gates; Peter S.	Cambridge			GB2
Baldwin; Derek	Cambridge			GB2

US-CL-CURRENT: 504/310; 504/196, 504/288, 504/291, 504/298, 504/301, 504/303,
504/305, 504/306, 504/313, 504/318, 504/350, 558/46, 558/47, 558/56, 558/57, 558/58,
987/41

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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☐ 49. Document ID: US 4183741 A

L37: Entry 49 of 53

File: USPT

Jan 15, 1980

US-PAT-NO: 4183741

DOCUMENT-IDENTIFIER: US 4183741 A

TITLE: Herbicidally-active heterocyclic compounds

DATE-ISSUED: January 15, 1980

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
West; Peter J.	Cambridge			GB2
Parsons; John H.	Saffron Walden			GB2

US-CL-CURRENT: 504/246; 544/343, 546/119, 546/64

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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KVMC

☐ 50. Document ID: US 4163846 A

L37: Entry 50 of 53

File: USPT

Aug 7, 1979

US-PAT-NO: 4163846

DOCUMENT-IDENTIFIER: US 4163846 A

TITLE: Substituted pyrazolopyrimidine compounds

DATE-ISSUED: August 7, 1979

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Percival; Albert	Cambridge			GB2
Judson; Philip N.	Cambridge			GB2

US-CL-CURRENT: 544/262; 504/241, 544/118

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments
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☐ 53. Document ID: US 4092149 A

L37: Entry 53 of 53

File: USPT

May 30, 1978

US-PAT-NO: 4092149

DOCUMENT-IDENTIFIER: US 4092149 A

TITLE: Method of increasing the yield of cotton plants

DATE-ISSUED: May 30, 1978

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Van Hoogstraten; Samuel David	Cambridge			EN

US-CL-CURRENT: 504/262

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMC
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L37: Entry 13 of 53

File: USPT

Aug 13, 2002

DOCUMENT-IDENTIFIER: US 6432878 B1

TITLE: Adjuvant composition

Abstract Text (1):

An adjuvant composition for pesticide formulations which exhibits reduced eye irritancy is comprised of a polyoxyalkylene aliphatic amine containing at least about 2 moles of an alkylene oxide group and an eye irritation reducing compound which simultaneously reduces the eye irritation caused by the polyoxyalkylene aliphatic amine and which complexes with metal ions such as calcium and iron which may be present in an aqueous solution of the adjuvant and a pesticide or a plant growth regulator. The eye irritation reducing compound is a carboxylic add that is capable of complexing with or forming chelates with metal ions in aqueous solution while simultaneously reducing the eye irritation caused by the polyoxyalkylene aliphatic amine. The adjuvant also contains a mixture of polyhydric alcohols and, optionally, a defoamer. The adjuvant is particularly in N-phosphonomethylglycine (glyphosate) herbicidal formulations.

Brief Summary Text (6):

One class of adjuvants that has found success in, for example, N-phosphonomethylglycine (glyphosate) formulations containing polyoxyalkylene aliphatic amines such as, for example, ethoxylated tallowamine. While polyoxyalkylene aliphatic amine-based adjuvants have excellent surfactant properties that often enhance the efficacy of aphytotoxicants such as glyphosate, they unfortunately are eye irritants and must be used with a high degree of caution.

Brief Summary Text (9):

The present invention is directed to an adjuvant composition for pesticide formulations which exhibits reduced eye irritancy. The adjuvant composition according to the invention is comprised of a polyoxyalkylene aliphatic amine containing at least about 2 moles of an alkylene oxide group and an eye irritation reducing compound which simultaneously reduces the eye irritation caused by the polyoxyalkylene aliphatic amine and which complexes with metal ions such as calcium and iron which may be present in an aqueous solution of the adjuvant and a pesticide or a plant growth regulator. The eye irritation reducing compound is a carboxylic add that is capable of complexing with or forming chelates with metal ions in aqueous solution while simultaneously reducing the eye irritation caused by the polyoxyalkylene aliphatic amine. The adjuvants according to the invention also contain a mixture of polyhydric alcohols and, optionally, a defoamer. The mixture of polyhydric alcohols is comprised of a trihydric alcohol, such as glycerol and one or more diols, such as ethylene glycol and propylene glycol. The adjuvant according to the invention is particularly useful in N-phosphonomethylglycine (glyphosate) herbicidal formulations. The invention is also directed to a method of killing or controlling weeds which comprises in contacting the weeds with a herbicidally effective amount of the composition according to the invention.

Brief Summary Text (17):

The carboxylic adds according to the invention also function as chelating agents. It is well known that chelating agents are compounds having donor atoms that can combine by coordinate bonding with a metal ion to form a cyclic structure known as a chelating complex. The donor atoms are present in separate functional groups within the same molecule. Thus, the carboxylic acids according to the invention are those having one or more carboxyl groups and one or more other functional groups capable

of interacting with polyvalent metal ions in aqueous solution such that a stable metal chelate is formed. For example, hydroxycarboxylic adds chelate through the oxygen donor atoms located in the carboxyl group and the alcohol group. Other such a carboxylic adds include, but are not limited to, aminocarboxylic acids such as ethylenediaminetetraacetic acid and its salts. N-phosphonomethylglydne (glyphosate) is an example of a herbicide that is partially or completely inactivated in aqueous solution by the presence of metal ions, particularly polyvalent metal ions such as Ca.sup.+2 and Fe.sup.+3.

Brief Summary Text (18):

The preferred carboxylic adds are hydroxycarboxylic acids that contain one or more carboxyl groups and one or more hydroxyl groups. Such acids that are particularly useful in the practice of the present invention include, but are not limited to, citric acid, glycolic add, gluconic add, alpha-hydroxybutyric add, malic add, saccharic acid, mandelic add, tartaric acid, glyceric acid. Citric add is especially preferred because it is non-toxic and can be used at relatively low concentrations. Another advantage to the use of citric add is its ability to increase the phytotoxicity of the herbicide glyphosate because citric acid readily complexes with metals such as calcium and iron, metals which are known to inactivate glyphosate. The amount of such carboxylic acids that can be present in the compositions according to the invention is an eye irritation-reducing amount which is any amount required to reduce the eye irritation of a pesticidal formulation containing the adjuvant according to the invention to an acceptable level. Such an amount will be readily determinable by those skilled in the art and will typically vary from about 0.05% to about 5% by weight of the adjuvant.

Brief Summary Text (21):

When used as an adjuvant with glyphosate, the adjuvant according to the invention is typically used at the level of from about 120 grams to about 180 grams of adjuvant per liter of an aqueous glyphosate solution containing about 480 grams of the isopropylamine salt of phosphonomethyl glycine. This is equivalent to from about 0.2% to about 0.40% by weight of a carboxylic acid having the ability to complex a metal ion.

Brief Summary Text (22):

The adjuvants according to the invention can be combined with a pesticidally effective amount of any type of pesticide to form a pesticidal composition. Examples of pesticides with which the adjuvants according to the invention can be formulated include, but are not limited to, glyphosate and acifluorfen(5(2-chloro-4(trifluoromethyl)phenoxy)-2-nitrobenzoic acid), chloramben(3-amino-2,5-dichlorobenzoic acid), 2,4-D ((2,4-dichlorophenoxy)acetic acid), endothal(7-oxabicydo(2.2.1)heptane-2,3-dicarboxylic acid), mecoprop(2-(2-methyl4chlorophenoxy)propionic acid), picloram(4-amino-3,5,6-trichloropyridine-2-carboxylic acid), 2,4,5-T((2,4,5-trichlorophenoxy)acetic add), benzac(2,3,6-trichlorobenzoic acid), dicamba(3,6-dichlor-o-anisic acid), MCPA(4-chloro-o-tolyloxyacetic acid), dalapon(2,2-dichloropropionic acid), dichlorprop(2-(2,4-dichlorophenoxy)propionic acid), MCPB(4-(4-chloro-o-tolyloxy)butyric acid), bialaphos(L-2-amino-4-((hydroxy)(methyl)phosphinoyl)butyryl-L-alanyl-L-ala nine), glufosinate((3-amino-3-carboxypropyl)methylphosphinate), imazethapyr(2-[4,5-dihydro4-methyl4-(1-methylethyl)-5-oxo-1-H-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid), imazaquin(2-[4,5-dihydro-4-methyl4(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-quinolinecarboxylic acid), mixtures thereof and the like. Preferred results, however, are obtained with the herbicide glyphosate whose activity is derived from N-phosphonomethylglycine. Glyphosate is normally formulated from water soluble salts thereof. The use of glyphosate and its derivatives as herbicides is disclosed in U.S. Pat. No. 3,853,530, the entire contents of which is incorporated herein by reference. The adjuvants of the present invention are especially useful in the preparation of pesticidal compositions designed to be delivered by spraying, particularly sprayable herbicidal compositions. When combined with a pesticide, the adjuvants according to the invention can be made into a concentrate which can subsequently be diluted with water to form an aqueous pesticidal composition ready for use by spraying.

Brief Summary Text (23):

Since glyphosate in acid form has limited water solubility (about 1.2%) the water soluble salts of glyphosate are normally used for most applications. Among the water soluble salts of glyphosate are the trimethylsulfonium salt, the ammonium salt, the isopropylamine salt, and the alkali metal salts, such as sodium and potassium. These compounds due to their solubility in water are the agriculturally acceptable glyphosate-containing compounds generally used in commerce. The relative amounts of herbicide, water and surfactant in the aqueous herbicidal compositions of this invention will vary depending upon many factors including but not limited to the identity and properties of the herbicide, method of application, locus to which the herbicide is applied, etc. The weight ratio of glyphosate expressed as acid equivalent to surfactant composition is normally in the range of 1:1 to 5:1.

Detailed Description Text (4):

A formulation containing 480 g/L (41% by weight) of the isopropylamine salt of glyphosate and 180 g/L (15.3% by weight) of the adjuvant of Example 1 (Sample A), was compared to commercial glyphosate products under the test protocols recited below. This formulation (Sample A) contained about 0.36% citric add by weight. Both types of ROUNDUP.RTM. contain the isopropylamine salt of glyphosate and ethoxylated tallow amine.

Detailed Description Text (9):

All formulations of glyphosate were brought into solution using tap water with no additional adjuvants added. The appropriate amount of compound was added to 80 ml of water to equal 800, 600, 400, 200, 100 g ae/ha when applied. Applications were made at the 2-3 leaf (B12-B13) stage with a track sprayer manufactured by Allen Machine Works utilizing a 8002E nozzle at 38 psi and a track speed of 2 mph. Application height was 18 inches above the plant canopy. This was the equivalent to an application volume of 187 L/ha. All treatments were replicated three times per species and randomized before transferring treated plant material to zone 12 or 14 for incubation during the duration of the experiment. Injury and phytotoxicity ratings were visual and taken on each pot at 7 and 14 days after treatment (DAT). The entries in the tables below range from 0% meaning no death to 100% meaning total death for a given application rate. The numbers in parentheses at the top of each table represents the number of trials conducted.

Detailed Description Paragraph Table (1):

Adjuvant Composition % Weight TRYMEEN .RTM. 6607 68.0 Citric Acid (50% Aqueous Solution) 4.0 Glycerine 15.0 AGNIQUE .RTM. DF 6889 Defoamer 0.1 Ethylene Glycol 2.0 Propylene Glycol 10.9 TRYMEEN .RTM. 6607 is tallow amine ethoxylated with an average of 20 moles of ethylene oxide, a trademark product of Henkel Corporation, Gulph Mills, PA 19406. AGNIQUE .RTM. DF 6889 Defoamer is a silicone emulsion, a trademark product of Henkel Corporation, Gulph Mills, PA 19406.

Detailed Description Paragraph Table (2):

TABLE 1 SAM- RAINBOW PLE PDII EYE CLEARANCE IRRITATION TROUT LC50 A 0.2 9.0 Day 4 (S) None (S) 35.4 72 Hrs (E) Mild (E) B 0.7 20.0 72 Hrs (S) Slight (S) 12.9 Day 10 (E) Moderate (E) C 0.6 19.5 72 Hrs (S) Slight (S) 5.7 Day 7 (E) Moderate (E) Sample B is ROUNDUP .RTM. Sample C is ROUNDUP .RTM. ULTRA PDII is Primary Dermal Irritation Index score of the Primary Skin Irritation Test conforming to U.S. EPA Health Effects Testing Guidelines, OPPTS 870.2500 (1998) and OECD Guidelines for Testing of Chemicals, Procedure 404; and/or JMAFF 59 NohSan No. 4200, January 28, 1985. Eye is Primary Eye Irritation Test conforming to U.S. EPA Health Effects Testing Guidelines, OPPTS 870.2500 (1998) and OECD Guidelines for Testing of Chemicals, Procedure 404; and/or JMAFF 59 Noh San No. 4200, January 28, 1985. The number is the Maximum Mean Total Score (MMTS) of this test. Irritation- describes the level of irritation observed in the skin (S) and eye (E) tests. Clearance- time required for irritation to clear observed in the skin (S) and eye (E) tests. Rainbow Trout - Static Acute Toxicity Test with Rainbow Trout, Oncorhynchus mykiss. Complies with U.S. EPA FIFRA Testing Guideline 72-1.

Current US Original Classification (1):

504/206

Current US Cross Reference Classification (1):

504/362

Other Reference Publication (1):

D.L. Shaner, "Effects of Glyphosate on Transpiration", Weed Science, Journal of The Weed Science Society of America, vol. 26, No. 5, Sep., 1978, pp. 513-516.

Other Reference Publication (4):

D.J. Turner, "The Effect Of Additives On The Control Of Agropyron Repens With Glyphosate", Conference on Grass Weeds in Cereals in the United Kingdom, University of Reading, Berkshire, England, Jan. 6-7, 1981, pp. 167-175.

CLAIMS:

7. The adjuvant of claim 6 wherein the alpha-hydroxycarboxylic add is citric acid.
9. An adjuvant composition comprising: (a) an ethoxylated tallowamine having an average degree of ethoxylation of from about 2 to about 50; (b) a mixture comprised of glycerol, ethylene glycol and propylene glycol; (c) an effective eye irritation reducing amount of citric acid.
12. The adjuvant of claim 8 wherein the amount of citric acid is about 2% by weight.
19. The pesticidal composition of claim 17 wherein the alpha-hydroxycarboxylic add is citric acid.
20. The pesticidal composition of claim 17 wherein the amount of citric acid in the adjuvant is from about 0.05% to about 5% by weight.
22. A method of killing or controlling weeds comprising contacting the weeds with a herbicidally effective amount of a water soluble composition: (a) an ethoxylated tallowamine having an average degree of ethoxylation of from about 2 to about 50; (b) a mixture comprised of glycerol, ethylene glycol and propylene glycol; (c) an effective eye irritation reducing amount of citric acid; and (d) a herbicidally effective amount of N-phosphonomethylglycine or a salt thereof.

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L37: Entry 15 of 53

File: USPT

Apr 2, 2002

DOCUMENT-IDENTIFIER: US 6365551 B1

TITLE: Highly concentrated glyphosate herbicidal compositionsBrief Summary Text (2):

The present invention generally relates to novel surfactant compositions, their preparation and to compositions containing these novel surfactant compositions, together with a pesticide, particularly a herbicide. More particularly, an important aspect of this invention is directed to surfactant compositions having reduced eye irritancy which are useful in the preparation of herbicidal compositions having reduced eye irritation properties in addition to their herbicidal effectiveness. In this regard, a further important aspect of the present invention concerns surfactant compositions which are effective in the formulation of glyphosate-containing herbicidal compositions or pesticidal compositions of other water soluble active ingredients. A method of using the herbicidal compositions is also provided.

Brief Summary Text (5):

One class of surfactants that has found success in the preparation of herbicidal compositions includes the polyoxyalkylene alkylamines such as, for example, ethoxylated tallowamine. These compounds have the necessary surface activity so that many otherwise water insoluble herbicides, as well as water soluble herbicides, can be formulated into concentrates which will form useful dispersions, emulsions and solutions in water. Herbicides formulated into dispersions, emulsions and solutions using these surfactants often have improved herbicidal properties. This class of surfactants is well known to potentiate the herbicidal activity of glyphosate.

Brief Summary Text (12):

It is known to formulate aqueous solutions of the herbicide glyphosate and sulfated nonalkoxylated C.sub.8 -C.sub.10 alkyl alcohol surfactants. Such herbicidal compositions have been sold by Monsanto Company of St. Louis, Mo., for example, under the trademark PONDMASTER.

Brief Summary Text (14):

Perhaps the most widely used herbicide worldwide is glyphosate, which chemically is N-phosphonomethylglycine. This product is normally used in an agriculturally acceptable form, such as a water soluble salt; e.g., the isopropylamine salt. For certain commercial uses glyphosate is made into a herbicidal concentrate composition containing a surfactant, which can then be diluted with water for use by the applicator. Often used surfactants for the preparation of these compositions are the aforementioned polyoxyalkylene alkylamines, especially ethoxylated tallowamine. European Patent 290,416 discloses combinations of solubilized glyphosate, equivalent to at least 40 grams per liter of glyphosate acid, and alkoxylated alkylamine surfactants in a ratio of the solubilized glyphosate (expressed as glyphosate acid equivalent) to amine surfactant of from about 1:1.75 to about 6:1. According to this European Patent, the compositions permit a reduction in the surfactant to glyphosate ratio without loss of herbicidal effectiveness. Clearly, the use of compositions containing glyphosate and alkoxylated tallowamine having reduced eye irritation is of considerable importance. The invention described herein presents a method of improving the highly desirable properties of such compositions.

Brief Summary Text (15):

The U.S. Environmental Protection Agency requires that currently commercial aqueous concentrate glyphosate herbicide solutions having an alkoxylated allylamine

surfactant be labelled to contain a precautionary statement that the solution can cause eye burns. To remedy or ameliorate this hazard is a desideratum of long standing.

Brief Summary Text (19):

Another object of the present invention is to provide compositions of the herbicide glyphosate having agriculturally acceptable herbicidal efficacy and reduced eye irritancy.

Brief Summary Text (26):

In accordance with a preferred embodiment of the present invention an aqueous solution is provided which comprises a herbicidally effective amount of a glyphosate herbicide, either in the acid or salt form, whose herbicidal effectiveness is enhanced by the presence of a potentiating effective amount of a Polyoxyalkylene alkylamine surfactant, and whose eye irritancy caused by the presence of said alkylamine surfactant in the solution is reduced by incorporating an eye irritation reducing amount of an anionic surfactant.

Brief Summary Text (30):

The present invention more specifically provides an aqueous or water soluble composition comprising one or more salts of glyphosate in a herbicidally effective amount. The composition contains an amine surfactant having the chemical structure ##STR1##

Brief Summary Text (31):

wherein x is a number from 7 to about 19, n.sub.1 and n.sub.2 are numbers independently selected from 1 to about 30, the average sum of n.sub.1 and n.sub.2 is greater than 2, and R.sub.1 and R.sub.2 are C.sub.2 -C.sub.4 alkylene radicals. The amine surfactant is present in an amount sufficient to potentiate the glyphosate herbicidal activity. Also present in the composition is an acidic compound having the chemical structure

Brief Summary Text (37):

With the alkoxyated alkylamine surfactants known to cause eye irritation in glyphosate-containing aqueous solutions and with the just discussed known drawbacks of anionic surfactants on skin, it is surprising and unexpected that the addition of an effective amount of anionic surfactants to the aqueous solutions of alkoxyated alkylamine surfactant would ameliorate the eye irritation thereof.

Brief Summary Text (40):

The polyoxyalkylene alkylamine surfactants are commercially available materials, being used as surfactants for the preparation of pesticidal compositions, particularly herbicidal compositions wherein the alkylamine enhances the activity of the herbicide. Glyphosate is one example where the alkylamines notably enhance or potentiate the herbicidal activity thereof. These amine surfactants can be prepared by reacting under suitable conditions, preferably in the presence of a catalyst, an alkylene oxide, preferably ethylene and/or propylene oxide with a long chain alkylamine, preferably an alkylamine containing from about 8 to about 20 carbon atoms. The oxyalkylated moiety can be a random or block copolymer of ethylene and propylene oxide units. These C.sub.8 -C.sub.20 alkyl primary amines may be derived from naturally occurring products such as tallow, coconut, soybean or cotton seed oils and as such are mixtures of amines. A preferred amine is tallowamine. The polyoxyalkylene derivatives thereof are prepared by reacting alkylene oxide with the selected alkylamine at elevated temperatures and pressure. Procedures for carrying out these reactions are known to those skilled in the art.

Brief Summary Text (60):

In general the surfactant composition comprises a major amount of polyoxyalkylene alkylamine component and an effective amount of the selected eye irritation reducing compound. The eye irritation reducing compound is present in the surfactant composition in an effective amount sufficient to reduce the eye irritation properties of the polyoxyalkylene alkylamine. When the eye irritation reducing compound is a sulfated polyoxyalkylene alkylphenol, preferred surfactant compositions can contain from about 50 to about 95 weight percent, preferably about 80 to about 85 weight percent, of the polyoxyalkylene alkylamine and from about 5 to

about 50 weight percent of the eye irritation reducing component. The optimum amount of each component in the surfactant blend depends on variables such as the identity of the eye irritation reducing compound, the identity of the pesticide, the type of application of the pesticide composition, storage and transportation of the surfactant and pesticide compositions, the conditions of use of the pesticidal compositions, etc. When a water soluble salt of glyphosate is the pesticide and sulfated polyoxyalkylene alkylphenol is the eye irritation reducing component, it has been found desirable to use a composition which comprises about 85 weight percent of the polyoxyalkylene alkylamine and about 15% by weight of the sulfated polyoxyalkylene alkylphenol. Other ratios may also be useful.

Brief Summary Text (65):

In general, a herbicidal composition known as a concentrate is first prepared. This composition in essence contains a herbicide and a surfactant mixture. Often it includes a minor amount of solvent, such as water. Alternatively, the concentrate composition may be in dry form with or without an inert solid carrier, for example, as a water soluble or water dispensible granular formulation. The ratio of herbicide to surfactant will depend on many factors, including but not limited to the identity of the components and the ultimate use. Usually the surfactant will comprise from about 5 to about 25 weight percent of this composition. The concentrate can then be diluted with water to form an aqueous herbicidal composition ready for use by spraying. The present herbicidal compositions are not limited to a particular herbicide or mixture of herbicides. They may be used with a variety of pesticides, including but not limited to herbicides in any of their water soluble salt forms.

Among such herbicides are glyphosate and acifluorfen

(5-(2-chloro-4-(trifluoromethyl)phenoxy)-2-nitrobenzoic acid), chloramben (3-amino-2,5-dichlorobenzoic acid), 2,4-D ((2,4-dichlorophenoxy) acetic acid), endothal (7-oxabicyclo(2.2.1)heptane-2,3-dicarboxylic acid), mecoprop (2-(2-methyl-4-chlorophenoxy) propionic acid), picloram (4-amino-3,5,6-trichloropyridine-2-carboxylic acid), 2,4,5-T((2,4,5-trichlorophenoxy)acetic acid), benzac (2,3,6-trichlorobenzoic acid), dicamba (3,6-dichloro-o-anisic acid), MCPA (4-chloro-o-tolyloxyacetic acid), dalapon (2,2-dichloropropionic acid), dichlorprop (2-(2,4-dichlorophenoxy)propionic acid), MCPB (4-(4-chloro-o-tolyloxy)butyric acid), bialaphos (L-2-amino-4-((hydroxy)(methyl) phosphinoyl) butyryl-L-alanyl-L-alanine), glufosinate ((3-amino-3-carboxypropyl)methylphosphinate), imazethapyr (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid), imazaquin (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-quinolinecarboxylic acid), mixtures thereof and the like. Preferred results, however, are obtained with the herbicide glyphosate whose activity is derived from N-phosphonomethylglycine. Glyphosate is normally formulated from water soluble salts thereof. U.S. Pat. No. 3,853,530 discloses the use of glyphosate and its derivatives as herbicides.

Brief Summary Text (66):

Since glyphosate in acid form has limited water solubility (about 1.2%) the water soluble salts of glyphosate are normally used for most applications. Among the water soluble salts of glyphosate are the trimethylsulfonium salt, the ammonium salt, the isopropylamine salt, and the alkali metal salts, such as sodium and potassium. These compounds due to their solubility in water are the agriculturally acceptable glyphosate-containing compounds generally used in commerce.

Brief Summary Text (67):

It is known to use mixtures of glyphosate and one or more of its water soluble salts. Previously mentioned European Patent 290,416 discloses the use of such mixtures which have the advantage of a higher concentration of glyphosate in the final product. However, the low solubility of the glyphosate in acid form limits the amount of it in the total composition. This amount will depend in general on the solubility of the water soluble salt used in the combination.

Brief Summary Text (68):

The pesticidal compositions previously described can be diluted with water to form an aqueous pesticidal composition which can be sprayed or otherwise applied to the desired area. Glyphosate-based herbicides are applied to the foliage of the

vegetation to be controlled.

Brief Summary Text (70):

The weight ratio of glyphosate expressed as acid equivalent to surfactant composition is normally in the range of 1:1 to 5:1.

Brief Summary Text (71):

Stable aqueous concentrate compositions of the present invention can be made with glyphosate salts at a concentration from about 5% to about 50%, preferably about 35% to about 45%, surfactant composition at a concentration of about 5% to about 25%, preferably about 10% to about 15%, and water making up the balance to 100%. Dry water soluble granular (WSG) or water dispersible granular (WDG) compositions of the present invention can be made with glyphosate salts at a concentration from about 10% to about 85%, preferably about 50% to about 80%, surfactant composition at a concentration of about 5% to about 30%, preferably about 10% to about 25%, and optionally inert ingredients making up the balance to 100%. All percentages above are understood as being by weight.

Brief Summary Text (77):

In one preferred embodiment of the present invention the surfactant composition comprised of the amine surfactant component and the sulfated polyoxyalkylene alkylphenol having sulfonate substituents in the phenyl moiety and/or phosphate ester as above defined can effectively be used to formulate glyphosate. Glyphosate is the widely recognized common name for N-phosphonomethylglycine, the biologically active entity of which is the acid form and may be used in the form of an ester but is normally used in the form of water soluble salts. Water soluble salts include alkali metal salts of glyphosate, and organic salts of glyphosate including onium salts such as ammonium, sulfonium and phosphonium salts of glyphosate. The most preferred salts include ammonium, isopropylammonium and trimethylsulfonium salts of glyphosate.

Brief Summary Text (79):

These following examples represent compositions tested to demonstrate the unexpectedly mild eye irritation properties provided by the present invention. All compositions contained the monoisopropylamine salt of glyphosate as the herbicide. Tables 1 and 2 contain the results of these tests. The following test procedure was used in these experiments.

Brief Summary Text (81):

Unless otherwise indicated in each of the following examples, an aqueous solution of the isopropylamine salt of glyphosate containing 61.3 weight percent of such glyphosate salt was used as the herbicidal component and is referred to as "glyphosate solution". A mixture of about 70 weight percent polyoxyethylene tallowamine containing from about 8 to 13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600) which may be abbreviated as PEG-600 was used as a component of the surfactant composition and is referred to as "ethoxylated tallowamine" or abbreviated as "ETA".

Brief Summary Text (83):

Examples 1 and 2 are experiments performed with a glyphosate composition containing ethoxylated tallowamine as its only surfactant component.

Detailed Description Text (2):

Example 1 was performed with a test material prepared by mixing glyphosate solution (69.3 grams), ethoxylated tallowamine (13.0 grams) and water (17.7 grams).

Detailed Description Text (4):

Example 2 was performed with a test material prepared by mixing glyphosate solution (69.3 grams), ethoxylated tallowamine (15.4 grams) and water (15.3 grams).

Detailed Description Text (5):

Examples 3-13 are experiments performed with a surfactant composition containing ethoxylated tallowamine and a sulfated ethoxylated nonylphenol.

Detailed Description Text (7):

Example 3 was performed with a test material prepared by mixing glyphosate solution (69.3 grams); water (15.3 grams) and surfactant composition (15.4 grams) having a pH of 7.5 and containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.2 grams) having 4 moles of ethylene oxide groups and about 3 weight percent sulfonate.

Detailed Description Text (9):

Example 4 was performed with a test material prepared by mixing glyphosate solution (69.3 grams); water (15.2 grams) and surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.5 grams) and sulfated polyoxyethylene nonylphenol (1.9 grams) having 2 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (11):

Example 5 was performed with a test material prepared by mixing glyphosate solution (69.3 grams); water (15.3 grams) and surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.5 grams) and sulfated polyoxyethylene nonylphenol (1.9 grams) having 2 moles of ethylene oxide groups and about 15 weight percent sulfonate.

Detailed Description Text (13):

Example 6 was performed with a test material prepared by mixing glyphosate solution (2.94 grams), water (96.39 grams) and surfactant composition (0.67 grams) containing JETCO ethoxylated tallowamine (0.57 grams) and sulfated polyethoxyethylene nonylphenol (0.10 grams) having 4 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (15):

Example 7 was prepared by mixing glyphosate solution (2.94 grams), water (96.39 grams) and surfactant composition (0.67 grams) containing ARMAK ethoxylated tallowamine (0.57 grams) and sulfated polyoxyethylene nonylphenol (0.10 grams) having 4 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (17):

Example 8 was prepared by mixing glyphosate solution (69.3 grams), water (15.3 grams) and surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (19):

Example 9 was prepared by mixing glyphosate solution (69.3 grams), water (15.3 grams) and surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide and about 13 weight percent sulfonate.

Detailed Description Text (21):

Example 10 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) having a pH of 6.5 containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide and about 85 weight percent sulfonate.

Detailed Description Text (23):

Example 11 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) having a pH of 7.1 containing ethoxylated tallowamine (13.8 grams) sulfated polyoxyethylene nonylphenol (1.5 grams) having with 4 moles of ethylene oxide and about 85 weight percent sulfonate.

Detailed Description Text (25):

Example 12 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) having a pH of 7 containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 10 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (27):

Example 13 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) containing ethoxylated tallowamine (11.9 grams) and sulfated polyoxyethylene nonylphenol (3.5 grams) having 10 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (28):

Examples 14 and 15 are experiments performed with a surfactant composition containing ethoxylated tallowamine and an alcohol sulfate.

Detailed Description Text (30):

Example 14 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.1 grams) and alcohol sulfate (2.3 grams) from a mixture of alcohols having from 8 to 10 straight chain carbon atoms.

Detailed Description Text (32):

Example 15 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.9 grams) and alcohol sulfate (1.5 grams) from a mixture of alcohols having from 8 to 10 carbon atoms.

Detailed Description Text (36):

Each of the test materials within the scope of the present invention, i.e. Examples 3-15 demonstrate a reduction of the eye irritancy by comparison with compositions of the prior art containing ethoxylated tallowamine but no eye irritation reducing compound, ie. Examples 1 and 2.

Detailed Description Text (37):

In order to determine the efficacy of herbicidal compositions containing a sulfated polyoxyethylene nonylphenol surfactant as an eye initiation reducing agent, the following tests were performed using the isopropylamine salt of glyphosate as the herbicide.

Detailed Description Text (39):

In this experiment, herbicidal compositions of the present invention were compared with a standard glyphosate composition for herbicidal efficacy. In the tests, material A (standard) was the glyphosate composition containing 15.47 weight percent ethoxylated tallowamine. Materials B, C and D were glyphosate compositions comprising a surfactant composition containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide and about 13 weight percent sulfonate as described in Example 9. Material B contained 15.49 weight percent of total surfactant, Material C contained 12.57 weight percent of total surfactant and Material D contained 10.0 weight percent of total surfactant.

Detailed Description Text (40):

The test materials were then diluted with water into 0.5, 1.0, 2.0 and 4.0 weight percent glyphosate aqueous solutions and sprayed onto a test field containing rhizome Johnsongrass. The test plots were evaluated 7 and 14 days after treatment. Percent control of the Johnsongrass is shown in Table 5.

Detailed Description Text (46):

In each of the following Examples 18-35, an aqueous solution of the isopropylamine salt of glyphosate containing 62.5 weight percent of such glyphosate salt was used as the herbicidal component and is referred to as "glyphosate solution".

Detailed Description Text (48):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition of this example consisted of 1) ethoxylated tallowamine (13.1 grams) containing about 16-17 moles of ethylene oxide units and about 2-5 weight percent polyethylene glycol (MW=600), and 2) a monohydric phosphate (2.3 grams) from a mixture of alcohols having from 8 to 10 straight chain carbon atoms, no ethylene oxide units, and a phosphomonoester to phosphodiester ratio of 65.5:19.8.

Detailed Description Text (50):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition of this example consisted of 1) ethoxylated tallowamine (12.3 grams) containing from about 16-17 moles of ethylene oxide units and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 18 (3.1 grams)

Detailed Description Text (52):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (13.1 grams) containing about 16-17 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) a phosphated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide groups and a phosphomonoester to phosphodiester ratio of 76.4:14.1.

Detailed Description Text (54):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.5 grams) containing about 16-17 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 20 (3.9 grams).

Detailed Description Text (56):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (12.3 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 20 (31 grams).

Detailed Description Text (58):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4) grams to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (13.1 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 18 (2.3 grams).

Detailed Description Text (60):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), polyethylene glycol (MW=400) (5.0 grams), and surfactant composition (10.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (6.2 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW =600), and 2) a phosphated polyoxyethylene nonylphenol (4.2 grams) having 4 moles of ethylene oxide groups and a phosphomonoester to phosphodiester ratio of 73.6:11.8.

Detailed Description Text (62):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.6 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) a monohydric phosphate of (3.8 grams) from a mixture of alcohols having from 8 to 10 straight chain carbon atoms, no ethylene oxide units, and a phosphomonoester to phosphodiester ratio of 64.3:20.7.

Detailed Description Text (64):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an

aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (9.2 grams) containing about 16-17 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 24 (6.2 grams).

Detailed Description Text (66):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), polyethylene glycol (MW=400) (5.0 grams), and surfactant composition (10.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (7.8 grams) containing from about 16-17 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 25 (2.6 grams).

Detailed Description Text (68):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), polyethylene glycol (MW=400) (5.0 grams), and surfactant composition (10.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (6.2 grams) containing from about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 24 (4.2 grams).

Detailed Description Text (70):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.6 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 25 (3.8 grams).

Detailed Description Text (72):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (9.2 grams) containing about 15 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 24 (6.2 grams).

Detailed Description Text (74):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), polyethylene glycol (MW=400) (5.0 grams), and surfactant composition (10.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (7.8 grams) containing about 15 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 25 (2.6 grams).

Detailed Description Text (77):

In this example of prior art a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (215 grams), and surfactant composition (10.0 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (7.2 grams) containing about 15 moles of ethylene oxide groups, and 2) additional polyethylene glycol (MW=600), ethylene glycol, and water to total 2.8 grams. The resulting composition was tested for eye irritation as above and gave results placing it in Toxicity Category I.

Detailed Description Text (79):

In this example of the present invention a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (18.2 grams), and surfactant composition (13.3 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (7.2 grams) containing about 15 moles of ethylene oxide groups, 2) the phosphated polyoxyethylene nonylphenol of Example 20 (3.0 grams) and 3) additional polyethylene glycol (MW=600) and dipropylene glycol to total 3.1 grams. The resulting composition was tested for eye irritation as above and gave results placing it in Toxicity Category III.

Detailed Description Text (81):

In this example of prior art a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.0 grams) containing about 15 moles of ethylene oxide groups, and 2) additional polyethylene glycol (MW=600), ethylene glycol, and water to total 4.4 grams. The resulting composition was tested for eye irritation as above and gave results placing it in Toxicity Category I.

Detailed Description Text (83):

In this example of the present invention a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (2.5 grams), and surfactant composition (29.0 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.0 grams) containing about 15 moles of ethylene oxide groups, 2) the phosphated polyoxyethylene nonylphenol of Example 20 (3.6 grams), and 3) additional polyethylene glycol 600, propylene glycol, and dipropylene glycol to total 14.4 grams. The resulting composition was tested for eye irritation as above and gave results placing it in Toxicity Category II.

Current US Original Classification (1):504/206

CLAIMS:

1. A concentrate herbicidal composition comprising:

an aqueous solution comprising glyphosate potassium salt, at a concentration of about 35 to about 50% by weight of the composition, and a surfactant.

6. The concentrate composition of claim 1 wherein said surfactant comprises an amine surfactant consisting of (i) one or more compounds having the chemical structure ##STR8##

where x is a number from about 7 to about 19, n.sub.1 and n.sub.2 are numbers independently selected from 1 to about 30, the average sum of n.sub.1 and n.sub.2 is 2 or greater, and R.sub.1 and R.sub.2 are C.sub.2 -C.sub.4 alkylene radicals; and (ii) one or more glycols selected from ethylene glycol, propylene glycol, polyethylene glycol and polypropylene glycol in an amount of zero to about 30% by weight of the amine surfactant component; said amine surfactant component being in an amount sufficient to potentiate herbicidal activity of the glyphosate potassium salt.

9. A concentrate herbicidal composition comprising:

an aqueous solution comprising glyphosate potassium salt, at a concentration of about 35 to about 45% by weight of the composition, and a surfactant.

14. The concentrate composition of claim 9 wherein said surfactant comprises an amine surfactant consisting of (i) one or more compounds having the chemical structure ##STR11##

where x is a number from about 7 to about 19, n.sub.1 and n.sub.2 are numbers independently selected from 1 to about 30, the average sum of n.sub.1 and n.sub.2 is 2 or greater, and R.sub.1 and R.sub.2 are C.sub.2 -C.sub.4 alkylene radicals; and (ii) one or more glycols selected from ethylene glycol, propylene glycol, polyethylene glycol and polypropylene glycol in an amount of zero to about 30% by weight of the amine surfactant component; said amine surfactant component being in an amount sufficient to potentiate herbicidal activity of the glyphosate potassium salt.

17. A concentrate herbicidal composition comprising an aqueous solution of glyphosate potassium salt at a concentration of about 45% to about 50% by weight of the composition.

18. The concentrate composition of claim 17, further comprising an amine surfactant

component consisting of (i) one or more compounds having the chemical structure
##STR14##

where x is a number from about 7 to about 19, n.sub.1 and n.sub.2 are numbers independently selected from 1 to about 30, the average sum of n.sub.1 and n.sub.2 is 2 or greater, and R.sub.1 and R.sub.2 are C.sub.2 -C.sub.4 alkylene radicals; and
(ii) one or more glycols selected from ethylene glycol, propylene glycol, polyethylene glycol and polypropylene glycol in an amount of zero to about 30% by weight of the amine surfactant component; said amine surfactant component being in an amount sufficient to potentiate herbicidal activity of the glyphosate potassium salt.

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File: USPT

Dec 11, 2001

DOCUMENT-IDENTIFIER: US 6329322 B1

TITLE: Hybrid ionic phosphorus surfactant adjuvants for bioactive compositions

Abstract Text (1):

Aqueous bioactive compositions having increased stability and enhanced bioefficacy comprising a bioactive compound, an effective amount of phosphate or phosphonate amphoteric surfactant having multiple ionic charges, and water. The preferred bioactive is a small ionic herbicide such as N-phosphonomethyl glycine or a salt thereof.

Brief Summary Text (9):

Perhaps the most widely used herbicide worldwide is glyphosate, which chemically is N-phosphonomethylglycine. This product is normally used in an agriculturally acceptable form, such as a water soluble salt, e.g., the isopropylamine salt. Often used surfactants for the preparation of glyphosate concentrates, which can then be diluted with water for use by the applicator, are the aforementioned polyoxyalkylene alkylamines, especially the ethoxylated tallow amines.

Brief Summary Text (11):

Another object of the present invention is to provide stable pesticidal compositions, especially herbicidal compositions, and most especially those containing glyphosate, having agriculturally acceptable efficacy and reduced eye irritation.

Brief Summary Text (16):

In accordance with a preferred embodiment of the present invention, an aqueous solution is provided which comprises a herbicidally effective amount of a glyphosate herbicide, either in acid or salt form, whose composition is stabilized and whose herbicidal effectiveness is enhanced by the presence of a potentiality effective amount of the phosphate or phosphonate amphoteric surfactant of the instant invention.

Brief Summary Text (64):

The preferred bioactives of this invention are the ionic bioactives that possess at least one ionic charge under conditions of use, i.e., at the pH of the aqueous medium during use. The preferred bioactives are the pesticides, especially the polyionic pesticides. The most preferred pesticides for use in the compositions of this invention are those that are small polyionic molecules, i.e. those having a molecular weight of less than about 300 g/mole. The very most preferred pesticides are the herbicidal actives such as N-phosphonomethyl glycine a.k.a. glyphosate and its salts such as the isopropylamine or trimethyl sulfonium salt (sulfosate); and 2-amino-4(hydroxymethylphosphinyl) butanoic acid (glufosinate).

Detailed Description Text (11):Glyphosate Formulation Stability EvaluationDetailed Description Text (12):

Rodeo, a trademark of the Monsanto Co. For a commercially available solution of glyphosate (N-phosphonomethyl glycine) in the form of its isopropylamine salt (53.8% conc. by wt), was blended with the product mixtures of Examples 1 and 2 and the stability of the solution with respect to phase separation under extreme temperature storage conditions was evaluated. The ester mixture of Example 1, with low dialkyl

phosphate content, is primarily composed of compounds of the formula IV wherein R.sub.4 is hydrogen, R.sub.5 is OH, Y is hydrogen, t is 0 with either one or both hydroxyl groups converted to phosphate esters, w and w' equals 0 or 1 but both cannot be 0. The mixture of Example 2, with higher hydroxyl group conversion and higher dialkyl ester content, would have fewer hydroxyl groups remaining and over one-fourth of the amine starting material would be bound into phosphoamphoteric oligomers of the general structure I, where "m" is a low integer (1 or 2) with the remainder primarily being the mono- and di-phosphate esters of the fatty amine bis-ethoxylate.

Detailed Description Paragraph Table (1):

TABLE 1	Glyphosate	Formulations	Component	Solution A	Solution B	Rodeo	7.63 g	7.63 g
Product from Ex. 1	1.00 g	Product from Ex. 2	1.17 g	Deionized Water	1.37 g	1.20		

Detailed Description Paragraph Table (2):

TABLE 1	Glyphosate	Formulations	Component	Solution A	Solution B	Rodeo	7.63 g	7.63 g
Product from Ex. 1	1.00 g	Product from Ex. 2	1.17 g	Deionized Water	1.37 g	1.20		

Current US Original Classification (1):

504/206

Current US Cross Reference Classification (1):

504/365

CLAIMS:

11. The aqueous composition of claim 10 wherein the small ionic herbicide is N-phosphonomethyl glycine or a salt thereof.

17. The aqueous composition of claim 16 wherein the herbicide is N-phosphonomethyl glycine or a salt thereof.

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L37: Entry 22 of 53

File: USPT

Sep 19, 2000

DOCUMENT-IDENTIFIER: US 6121200 A

TITLE: Compositions of polyoxyalkylene alkylamine surfactants having reduced eye irritation

Brief Summary Text (3):

compositions, together with a pesticide, particularly a herbicide. More particularly, an important aspect of this invention is directed to surfactant compositions having reduced eye irritancy which are useful in the preparation of herbicidal compositions having reduced eye irritation properties in addition to their herbicidal effectiveness. In this regard, a further important aspect of the present invention concerns surfactant compositions which are effective in the formulation of glyphosate-containing herbicidal compositions or pesticidal compositions of other water soluble active ingredients. A method of using the herbicidal compositions is also provided.

Brief Summary Text (6):

One class of surfactants that has found success in the preparation of herbicidal compositions includes the polyoxyalkylene alkylamines such as, for example, ethoxylated tallowamine. These compounds have the necessary surface activity so that many otherwise water insoluble herbicides, as well as water soluble herbicides, can be formulated into concentrates which will form useful dispersions, emulsions and solutions in water. Herbicides formulated into dispersions, emulsions and solutions using these surfactants often have improved herbicidal properties. This class of surfactants is well known to potentiate the herbicidal activity of glyphosate.

Brief Summary Text (13):

It is known to formulate aqueous solutions of the herbicide glyphosate and sulfated nonalkoxylated C.sub.8-C.sub.10 alkyl alcohol surfactants. Such herbicidal compositions have been sold by Monsanto Company of St. Louis, Mo., for example, under the trademark PONDMASTER.

Brief Summary Text (15):

Perhaps the most widely used herbicide worldwide is glyphosate, which chemically is N-phosphonomethylglycine. This product is normally used in an agriculturally acceptable form, such as a water soluble salt; e.g., the isopropylamine salt. For certain commercial uses glyphosate is made into a herbicidal concentrate composition containing a surfactant, which can then be diluted with water for use by the applicator. Often used surfactants for the preparation of these compositions are the aforementioned polyoxyalkylene alkylamines, especially ethoxylated tallowamine. European Patent 290,416 discloses combinations of solubilized glyphosate, equivalent to at least 40 grams per liter of glyphosate acid, and alkoxyated alkylamine surfactants in a ratio of the solubilized glyphosate (expressed as glyphosate acid equivalent) to amine surfactant of from about 1:1.75 to about 6:1. According to this European Patent, the compositions permit a reduction in the surfactant to glyphosate ratio without loss of herbicidal effectiveness. Clearly, the use of compositions containing glyphosate and alkoxyated tallowamine having reduced eye irritation is of considerable importance. The invention described herein presents a method of improving the highly desirable properties of such compositions.

Brief Summary Text (16):

The U.S. Environmental Protection Agency requires that currently commercial aqueous concentrate glyphosate herbicide solutions having an alkoxyated alkylamine

surfactant be labelled to contain a precautionary statement that the solution can cause eye burns. To remedy or ameliorate this hazard is a desideratum of long standing.

Brief Summary Text (20):

Another object of the present invention is to provide compositions of the herbicide glyphosate having agriculturally acceptable herbicidal efficacy and reduced eye irritancy.

Brief Summary Text (27):

In accordance with a preferred embodiment of the present invention an aqueous solution is provided which comprises a herbicidally effective amount of a glyphosate herbicide, either in the acid or salt form, whose herbicidal effectiveness is enhanced by the presence of a potentiating effective amount of a polyoxyalkylene alkylamine surfactant, and whose eye irritancy caused by the presence of said alkylamine surfactant in the solution is reduced by incorporating an eye irritation reducing amount of an anionic surfactant.

Brief Summary Text (31):

The present invention more specifically provides an aqueous or water soluble composition comprising one or more salts of glyphosate in a herbicidally effective amount. The composition contains an amine surfactant having the chemical structure ##STR1## wherein x is a number from 7 to about 19, n.sub.1, and n.sub.2 are numbers independently selected from 1 to about 30, the average sum of n.sub.1, and n.sub.2 is greater than 2, and R.sub.1, and R.sub.2 are C.sub.2 -C.sub.4 alkylene radicals. The amine surfactant is present in an amount sufficient to potentiate the glyphosate herbicidal activity. Also present in the composition is an acidic compound having the chemical structure

Brief Summary Text (37):

With the alkoxyated alkylamine surfactants known to cause eye irritation in glyphosate-containing aqueous solutions and with the just discussed known drawbacks of anionic surfactants on skin, it is surprising and unexpected that the addition of an effective amount of anionic surfactants to the aqueous solutions of alkoxyated alkylamine surfactant would ameliorate the eye irritation thereof.

Brief Summary Text (41):

enhances the activity of the herbicide. Glyphosate is one example where the alkylamines notably enhance or potentiate the herbicidal activity thereof. These amine surfactants can be prepared by reacting under suitable conditions, preferably in the presence of a catalyst, an alkylene oxide, preferably ethylene and/or propylene oxide with a long chain alkylamine, preferably an alkylamine containing from about 8 to about 20 carbon atoms. The oxyalkylated moiety can be a random or block copolymer of ethylene and propylene oxide units. These C.sub.8 -C.sub.20 alkyl primary amines may be derived from naturally occurring products such as tallow, coconut, soybean or cotton seed oils and as such are mixtures of amines. A preferred amine is tallowamine. The polyoxyalkylene derivatives thereof are prepared by reacting alkylene oxide with the selected alkylamine at elevated temperatures and pressure. Procedures for carrying out these reactions are known to those skilled in the art.

Brief Summary Text (56):

In general the surfactant composition comprises a major amount of polyoxyalkylene alkylamine component and an effective amount of the selected eye irritation reducing compound. The eye irritation reducing compound is present in the surfactant composition in an effective amount sufficient to reduce the eye irritation properties of the polyoxyalkylene alkylamine. When the eye irritation reducing compound is a sulfated polyoxyalkylene alkylphenol, preferred surfactant compositions can contain from about 50 to about 95 weight percent, preferably about 80 to about 85 weight percent, of the polyoxyalkylene alkylamine and from about 5 to about 50 weight percent of the eye irritation reducing component. The optimum amount of each component in the surfactant blend depends on variables such as the identity of the eye irritation reducing compound, the identity of the pesticide, the type of application of the pesticide composition, storage and transportation of the surfactant and pesticide compositions, the conditions of use of the pesticidal

compositions, etc. When a water soluble salt of glyphosate is the pesticide and sulfated polyoxyalkylene alkylphenol is the eye irritation reducing component, it has been found desirable to use a composition which comprises about 85 weight percent of the polyoxyalkylene alkylamine and about 15% by weight of the sulfated polyoxyalkylene alkylphenol. Other ratios may also be useful.

Brief Summary Text (61):

In general, a herbicidal composition known as a concentrate is first prepared. This composition in essence contains a herbicide and a surfactant-mixture. Often it includes a minor amount of solvent, such as water. Alternatively, the concentrate composition may be in dry form with or without an inert solid carrier, for example, as a water soluble or water dispensible granular formulation. The ratio of herbicide to surfactant will depend on many factors, including but not limited to the identity of the components and the ultimate use. Usually the surfactant will comprise from about 5 to about 25 weight percent of this composition. The concentrate can then be diluted with water to form an aqueous herbicidal composition ready for use by spraying. The present herbicidal compositions are not limited to a particular herbicide or mixture of herbicides. They may be used with a variety of pesticides, including but not limited to herbicides in any of their water soluble salt forms.

Among such herbicides are glyphosate and acifluorfen

(5-(2-chloro4-(trifluoromethyl)phenoxy)-2-nitrobenzoic acid), chloramben (3-amino-2,5-dichlorobenzoic acid), 2,4-D ((2,4-dichlorophenoxy) acetic acid), endothal (7-oxabicyclo(2,2,1)heptane-2,3-dicarboxylic acid), mecoprop (2-(2-methyl-4-chlorophenoxy) propionic acid), picloram (4-amino-3,5,6-trichloropyridine-2-carboxylic acid), 2,4,5-T((2,4,5-trichlorophenoxy)acetic acid), benzac (2,3,6-trichlorobenzoic acid), dicamba (3,6-dichloro-o-anisic acid), MCPA

Brief Summary Text (62):

(4-chloro-o-tolyloxyacetic acid), dalapon (2,2-dichloropropionic acid), dichlorprop (2-(2,4-dichlorophenoxy)propionic acid), MCPB (4-(4-chloro-o-tolyloxy)butyric acid), bialaphos (L-2-amino-4-((hydroxy)(methyl) phosphinoyl) butyryl-L-alanyl-L-alanine), glufosinate ((3-amino-3-carboxypropyl)methylphosphinate), imazethapyr (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-5-ethyl-3-pyridinecarboxylic acid), imazaquin (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-quinolinecarboxylic acid), mixtures thereof and the like. Preferred results, however, are obtained with the herbicide glyphosate whose activity is derived from N-phosphonomethylglycine. Glyphosate is normally formulated from water soluble salts thereof. U.S. Pat. 3,853,530 discloses the use of glyphosate and its derivatives as herbicides.

Brief Summary Text (63):

Since glyphosate in acid form has limited water solubility (about 1.2%) the water soluble salts of glyphosate are normally used for most applications. Among the water soluble salts of glyphosate are the trimethylsulfonium salt, the ammonium salt, the isopropylamine salt, and the alkali metal salts, such as sodium and potassium. These compounds due to their solubility in water are the agriculturally acceptable glyphosate-containing compounds generally used in commerce.

Brief Summary Text (64):

It is known to use mixtures of glyphosate and one or more of its water soluble salts. Previously mentioned European Patent 290,416 discloses the use of such mixtures which have the advantage of a higher concentration of glyphosate in the final product. However, the low solubility of the glyphosate in acid form limits the amount of it in the total composition. This amount will depend in general on the solubility of the water soluble salt used in the combination.

Brief Summary Text (65):

The pesticidal compositions previously described can be diluted with water to form an aqueous pesticidal composition which can be sprayed or otherwise applied to the desired area. Glyphosate-based herbicides are applied to the foliage of the vegetation to be controlled.

Brief Summary Text (67):

The weight ratio of glyphosate expressed as acid equivalent to surfactant composition is normally in the range of 1:1 to 5:1.

Brief Summary Text (68):

Stable aqueous concentrate compositions of the present invention can be made with glyphosate salts at a concentration from about 5% to about 50%, preferably about 35% to about 45%, surfactant composition at a concentration of about 5% to about 25%, preferably about 10% to about 15%, and water making up the balance to 100%. Dry water soluble granular (WSG) or water dispersible granular (WDG) compositions of the present invention can be made with glyphosate salts at a concentration from about 10% to about 85%, preferably about 50% to about 80%, surfactant composition at a concentration of about 5% to about 30%, preferably about 10% to about 25%, and optionally inert ingredients making up the balance to 100%. All percentages above are understood as being by weight.

Brief Summary Text (72):

In one preferred embodiment of the present invention the surfactant composition comprised of the amine surfactant component and the sulfated polyoxyalkylene alkylphenol having sulfonate substituents in the phenyl moiety and/or phosphate ester as above defined can effectively be used to formulate glyphosate. Glyphosate is the widely recognized common name for N-phosphonomethylglycine, the biologically active entity of which is the acid form and may be used in the form of an ester but is normally used in the form of water soluble salts. Water soluble salts include alkali metal salts of glyphosate, and organic salts of glyphosate including onium salts such as ammonium, sulfonium and phosphonium salts of glyphosate. The most preferred salts include ammonium, isopropylammonium and trimethylsulfonium salts of glyphosate.

Brief Summary Text (74):

These following examples represent compositions tested to demonstrate the unexpectedly mild eye irritation properties provided by the present invention. All compositions contained the monoisopropylamine salt of glyphosate as the herbicide. Tables 1 and 2 contain the results of these tests. The following test procedure was used in these experiments.

Brief Summary Text (76):

Unless otherwise indicated in each of the following examples, an aqueous solution of the isopropylamine salt of glyphosate containing 61.3 weight percent of such glyphosate salt was used as the herbicidal component and is referred to as "glyphosate solution". A mixture of about 70 weight percent polyoxyethylene tallowamine containing from about 8 to 13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600) which may be abbreviated as PEG-600 was used as a component of the surfactant composition and is referred to as "ethoxylated tallowamine" or abbreviated as "ETA".

Detailed Description Text (2):

Examples 1 and 2 are experiments performed with a glyphosate composition containing ethoxylated tallowamine as its only surfactant component.

Detailed Description Text (4):

Example 1 was performed with a test material prepared by mixing glyphosate solution (69.3 grams), ethoxylated tallowamine (13.0 grams) and water (17.7 grams).

Detailed Description Text (6):

Example 2 was performed with a test material prepared by mixing glyphosate solution (69.3 grams), ethoxylated tallowamine (15.4 grams) and water (15.3 grams).

Detailed Description Text (7):

Examples 3-13 are experiments performed with a surfactant composition containing ethoxylated tallowamine and a sulfated ethoxylated nonylphenol.

Detailed Description Text (9):

Example 3 was performed with a test material prepared by mixing glyphosate solution (69.3 grams); water (15.3 grams) and surfactant composition (15.4 grams) having a pH of 7.5 and containing ethoxylated tallowamine (13.1 grams) and sulfated

polyoxyethylene nonylphenol (2.2 grams) having 4 moles of ethylene oxide groups and about 3 weight percent sulfonate.

Detailed Description Text (11):

Example 4 was performed with a test material prepared by mixing glyphosate solution (69.3 grams); water (15.2 grams) and surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.5 grams) and sulfated polyoxyethylene nonylphenol (1.9 grams) having 2 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (13):

Example 5 was performed with a test material prepared by mixing glyphosate solution (69.3 grams), water (15.3 grams) and surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.5 grams) and sulfated polyoxyethylene nonylphenol (1.9 grams) having 2 moles of ethylene oxide groups and about 15 weight percent sulfonate.

Detailed Description Text (15):

Example 6 was performed with a test material prepared by mixing glyphosate solution (2.94 grams), water (96.39) grams and surfactant composition (0.67 grams) containing JETCO ethoxylated tallowamine (0.57 grams) and sulfated polyethoxyethylene nonylphenol (0.10 grams) having 4 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (17):

Example 7 was prepared by mixing glyphosate solution (2.94 grams), water (96.39 grams) and surfactant composition (0.67 grams) containing ARMAK ethoxylated tallowamine (0.57 grams) and sulfated polyoxyethylene nonylphenol (0.10 grams) having 4 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (19):

Example 8 was prepared by mixing glyphosate solution (69.3 grams), water (15.3 grams) and surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (21):

Example 9 was prepared by mixing glyphosate solution (69.3 grams), water (15.3 grams) and surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide and about 13 weight percent sulfonate.

Detailed Description Text (23):

Example 10 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) having a pH of 6.5 containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide and about 85 weight percent sulfonate.

Detailed Description Text (25):

Example 11 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) having a pH of 7.1 containing ethoxylated tallowamine (13.8 grams) sulfated polyoxyethylene nonylphenol (1.5 grams) having with 4 moles of ethylene oxide and about 85 weight percent sulfonate.

Detailed Description Text (27):

Example 12 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) having a pH of 7 containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 10 moles of ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (29):

Example 13 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) containing ethoxylated tallowamine (11.9 grams) and sulfated polyoxyethylene nonylphenol (3.5 grams) having 10 moles of

ethylene oxide groups and about 6 weight percent sulfonate.

Detailed Description Text (30):

Examples 14 and 15 are experiments performed with a surfactant composition containing ethoxylated tallowamine and an alcohol sulfate.

Detailed Description Text (32):

Example 14 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.1 grams) and alcohol sulfate (2.3 grams) from a mixture of alcohols having from 8 to 10 straight chain carbon atoms.

Detailed Description Text (34):

Example 15 was prepared by mixing a glyphosate solution (69.3 grams), water (15.3 grams) and a surfactant composition (15.4 grams) containing ethoxylated tallowamine (13.9 grams) and alcohol sulfate (1.5 grams) from a mixture of alcohols having from 8 to 10 carbon atoms.

Detailed Description Text (39):

Each of the test materials within the scope of the present invention, i.e. Examples 3-15 demonstrate a reduction of the eye irritancy by comparison with compositions of the prior art containing ethoxylated tallowamine but no eye irritation reducing compound, ie. Examples 1 and 2.

Detailed Description Text (40):

In order to determine the efficacy of herbicidal compositions containing a sulfated polyoxyethylene nonylphenol surfactant as an eye initiation reducing agent, the following tests were performed using the isopropylamine salt of glyphosate as the herbicide.

Detailed Description Text (42):

In this experiment, herbicidal compositions of the present invention were compared with a standard glyphosate composition for herbicidal efficacy. In the tests, material A (standard) was the glyphosate composition containing 15.47 weight percent ethoxylated tallowamine. Materials B, C and D were glyphosate compositions comprising a surfactant composition containing ethoxylated tallowamine (13.1 grams) and sulfated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide and about 13 weight percent sulfonate as described in Example 9. Material B contained 15.49 weight percent of total surfactant, Material C contained 12.57 weight percent of total surfactant and Material D contained 10.0 weight percent of total surfactant.

Detailed Description Text (43):

The test materials were then diluted with water into 0.5, 1.0, 2.0 and 4.0 weight percent glyphosate aqueous solutions and sprayed onto a test field containing rhizome Johnsongrass. The test plots were evaluated 7 and 14 days after treatment. Percent control of the Johnsongrass is shown in Table 5.

Detailed Description Text (50):

In each of the following Examples 18-35, an aqueous solution of the isopropylamine salt of glyphosate containing 62.5 weight percent of such glyphosate salt was used as the herbicidal component and is referred to as "glyphosate solution".

Detailed Description Text (52):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition of this example consisted of 1) ethoxylated tallowamine (13.1 grams) containing about 16-17 moles of ethylene oxide units and about 2-5 weight percent polyethylene glycol (MW=600), and 2) a monohydric phosphate (2.3 grams) from a mixture of alcohols having from 8 to 10 straight chain carbon atoms, no ethylene oxide units, and a phosphomonoester to phosphodiester ratio of 65.5:19.8.

Detailed Description Text (54):

In this example a herbicidal composition was prepared by mixing glyphosate solution

(68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition of this example consisted of 1) ethoxylated tallowamine (12.3 grams) containing from about 16-17 moles of ethylene oxide units and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 18 (3.1 grams).

Detailed Description Text (56):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (13.1 grams) containing about 16-17 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) a phosphated polyoxyethylene nonylphenol (2.3 grams) having 4 moles of ethylene oxide groups and a phosphomonoester to phosphodiester ratio of 76.4:14.1.

Detailed Description Text (58):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.5 grams) containing about 16-17 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 20 (3.9 grams).

Detailed Description Text (60):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (12.3 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 20 (3.1 grams).

Detailed Description Text (62):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (13.1 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 18 (2.3 grams).

Detailed Description Text (64):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), polyethylene glycol (MW=400) (5.0 grams), and surfactant composition (10.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (6.2 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) a phosphated polyoxyethylene nonylphenol (4.2 grams) having 4 moles of ethylene oxide groups and a phosphomonoester to phosphodiester ratio of 73.6:11.8.

Detailed Description Text (66):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.6 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) a monohydric phosphate of (3.8 grams) from a mixture of alcohols having from 8 to 10 straight chain carbon atoms, no ethylene oxide units, and a phosphomonoester to phosphodiester ratio of 64.3:20.7.

Detailed Description Text (68):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (9.2 grams) containing about 16-17 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene

nonylphenol of Example 24 (6.2 grams).

Detailed Description Text (70):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), polyethylene glycol (MW=400) (5.0 grams), and surfactant composition (10.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (7.8 grams) containing from about 16-17 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 25 (2.6 grams).

Detailed Description Text (72):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), polyethylene glycol (MW=400) (5.0 grams), and surfactant composition (10.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (6.2 grams) containing from about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 24 (4.2 grams).

Detailed Description Text (74):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.6 grams) containing about 8-13 moles of ethylene oxide groups and about 30 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 25 (3.8 grams).

Detailed Description Text (76):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition (15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (9.2 grams) containing about 15 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the phosphated polyoxyethylene nonylphenol of Example 24 (6.2 grams).

Detailed Description Text (78):

In this example a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), polyethylene glycol (MW=400) (5.0 grams), and surfactant composition (10.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (7.8 grams) containing about 15 moles of ethylene oxide groups and about 2-5 weight percent polyethylene glycol (MW=600), and 2) the monohydric phosphate of Example 25 (2.6 grams).

Detailed Description Text (81):

In this example of prior art a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (21.5 grams), and surfactant composition (10.0 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (7.2 grams) containing about 15 moles of ethylene oxide groups, and 2) additional polyethylene glycol (MW=600), ethylene glycol, and water to total 2.8 grams. The resulting composition was tested for eye irritation as above and gave results placing it in Toxicity Category I.

Detailed Description Text (83):

In this example of the present invention a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (18.2 grams), and surfactant composition (13.3 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (7.2 grams) containing about 15 moles of ethylene oxide groups, 2) the phosphated polyoxyethylene nonylphenol of Example 20 (3.0 grams) and 3) additional polyethylene glycol (MW=600) and dipropylene glycol to total 3.1 grams. The resulting composition was tested for eye irritation as above and gave results placing it in Toxicity Category III.

Detailed Description Text (85):

In this example of prior art a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (16.1 grams), and surfactant composition

(15.4 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.0 grams) containing about 15 moles of ethylene oxide groups, and 2) additional polyethylene glycol (MW=600), ethylene glycol, and water to total 4.4 grams. The resulting composition was tested for eye irritation as above and gave results placing it in Toxicity Category I.

Detailed Description Text (87):

In this example of the present invention a herbicidal composition was prepared by mixing glyphosate solution (68.5 grams), water (2.5 grams), and surfactant composition (29.0 grams) to form an aqueous solution. The surfactant composition consisted of 1) ethoxylated tallowamine (11.0 grams) containing about 15 moles of ethylene oxide groups, 2) the phosphated polyoxyethylene nonylphenol of Example 20 (3.6 grams), and 3) additional polyethylene glycol 600, propylene glycol, and dipropylene glycol to total 14.4 grams. The resulting composition was tested for eye irritation as above and gave results placing it in Toxicity Category II.

Current US Original Classification (1):

504/206

Current US Cross Reference Classification (1):

504/362

CLAIMS:

9. The method of claim 8 wherein the pesticide is a herbicide selected from water soluble salts of acifluorfen, benzac, bialaphos, chloramben, 2,4-D, dalapon, dicamba, dichlorprop, endothal, glufosinate, glyphosate, imazaquin, imazethapyr, MCPA, MCPB, mecoprop, picloram and mixtures thereof.

10. The method of claim 9 wherein the herbicide is a salt of glyphosate selected from the trimethylsulfonium, ammonium, isopropylamine, sodium and potassium salts.

12. The method of claim 11 wherein the pesticide is a herbicide selected from water soluble salts of acifluorfen, benzac, bialaphos, chloramben, 2,4-D, dalapon, dicamba, dichlorprop, endothal, glufosinate, glyphosate, imazaquin, imazethapyr, MCPA, MCPB, mecoprop, picloram and mixtures thereof.

13. The method of claim 12 wherein the herbicide is a salt of glyphosate selected from the trimethylsulfonium, ammonium, isopropylamine, sodium and potassium salts.

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File: USPT

Mar. 2, 1999

DOCUMENT-IDENTIFIER: US 5877112 A
TITLE: Agricultural formulation

Abstract Text (1):

The invention pertains to new composition and a method for increasing the solubility of various agricultural compounds in water at a low pH. The compounds included in this patent are typically not soluble at pH ranges less than 7 to produce commercially viable liquid concentrates. This method requires the use of tallowamine ethoxylates and phosphate esters to lower the pH of various compounds and also keep them soluble in water.

Brief Summary Text (2):

Many agricultural formulations contain water soluble salts. These salts, often alkylamine salts, are generally not as active as their acid equivalents. For example, 2,4-Dichlorophenoxyacetic acid (2,4-D acid) is known to be more herbicidally active than the dimethylamine salt of 2, 4-D. However, the 2, 4-D acid is not soluble in water. Solvents used to formulate, 2,4-D acid are known to be phytotoxic to plants and enhance herbicide volatility and subsequent drift to non-target areas. In another example, boron is known to be available to plants only in the boric acid form. However, boric acid is only soluble at relatively low concentrations in water, while the monoethanolamine salt of boric acid is known to be much more soluble.

Brief Summary Text (4):

Fattyamine ethoxylates have been known to be used in agricultural formulations in the past. Specifically, tallowamine ethoxylate surfactant is known to enhance glyphosate activity and translocation.

Brief Summary Text (6):

U.S. Pat. No. 4,440,562 assigned to Monsanto Company, which is incorporated by reference in its entirety, describes the use of phosphate esters to couple the isopropylamine salt of glyphosate into the water insoluble 2-haloacetanilide herbicide. Again, pH is not a relevant factor and this patent does not address the use of other pesticides than glyphosate.

Brief Summary Text (14):

The present invention is a homogenous agricultural liquid composition containing at least an acidic ester surfactant, and an amine containing surfactant, preferably a fatty amine ethoxylate surfactant, at least one other agricultural chemical. The agricultural chemical referred to herein, can be used in agricultural or non-applications. The agricultural applications include, but are not limited to pesticide, fertilizer, or plant growth regulators. The non-agricultural applications include, but are not limited to forestry, aquatics, right of way (such as the areas along roads or medians), turf (such as lawns, golf courses etc.) ornamental (such as plants for their beauty) municipal (parks, school, open land, etc.).

Brief Summary Text (15):

Optionally, other surfactants or formulation aids can be added. The formulation can have a pH of less than about 7. It is also possible to add a buffering agent to further decrease the pH of the composition. Preferably, the acidic ester surfactant is a phosphate ester and the fatty amine is a tallowamine ethoxylate. The composition allows water soluble salts of agricultural chemicals to remain stable

and soluble at lower than normal pH ranges.

Brief Summary Text (17):

It has been surprisingly discovered that a wide range of water soluble compounds can be stabilized at lower than normal pH ranges using a combination of acidic ester surfactants and amine containing surfactants such as but not limited to fatty amine ethoxylates. In addition, the composition can contain a phosphate ester surfactant and a tallowamine ethoxylate surfactant.

Brief Summary Text (31):

Additionally, the fatty amine alkoxyate can be a block copolymer derived from the sequential addition of ethylene oxide and propylene oxide to ethylenediamine of the formula ##STR6##

Brief Summary Text (34):

The most preferred fatty amine alkoxyate surfactant is a tallowamine ethoxylate. The fatty amine containing surfactant can be present in an amount from about 1 to about 99%. Preferably, the fatty amine containing surfactant is present in an amount sufficient to enhance the efficacy of the crop protection chemicals.

Brief Summary Text (35):

The agricultural chemical can be a fertilizer containing boron, zinc, copper, iron, blends of nitrogen phosphorous and potash or mixtures thereof. The agricultural chemical can be a crop protecting chemical such as but not limited to a herbicide. The herbicide can be, but not limited to, dimethylamine (DMA) salt of 2,4-dichlorophenoxyacetic acid, DMA salt of dicamba, sodium salt of dicamba, isopropylamine (IPA) salt of glyphosate, IPA salt of 2,4-dichlorophenoxyacetic acid, sodium salt of acifluorfen, sodium-salt of bentazon, sodium salt of imazethapyr, ammonium salt of imazaquin, IPA salt of imazapyr, sodium salt of asulam or mixtures thereof. The agricultural chemical can be present in an amount from about 1 to about 99%.

Brief Summary Text (36):

The composition can contain micronutrients such as boron. In example I, Ott's patented composition of a monoethanolamine salt of boric acid is further unexpectedly improved by using a blend of phosphate ester and an amine surfactant such as tallowamine ethoxylate.

Brief Summary Text (60):

e) citric acid,

Brief Summary Text (61):

f) glutaric acid,

Detailed Description Text (3):

The patented composition can contain pesticides such as the dimethylamine salt of 2,4-Dichlorophenoxyacetic acid (2,4-D Amine). In Example 2, a dimethylamine salt of 2,4-D is formulated which with phosphate ester surfactants, tallowamine ethoxylate surfactant, and other wetting agents. The resulting composition has a pH of about 4.5, as opposed to conventional dimethylamine salt of 2,4-D formulations which have a pH of about 8.5. Furthermore, the formulation is significantly more compatible with liquid fertilizer solutions. In mixes containing only urea-ammonia nitrate fertilizer, the traditional 2,4-D Amine product formed crystals. The formulation in Example 2 produced a nice clear solution.

Detailed Description Text (5):

The stability of the composition in Example 2 is excellent, over more than 2 months in accelerated storage tests, and therefore is expected to be stable at normal temperatures for at least 2 years. Furthermore, efficacy trials showed enhanced herbicide activity with the formulation of Example 2 when compared with commercial 2,4-D Amine products.

Detailed Description Text (6):

In Example 3 the compatibility of two water soluble herbicides is enhanced using phosphate ester surfactants and tallowamine ethoxylate surfacts. Plateau herbicide

is a water-based formulation, containing the active ingredient, imazameth, and manufactured by American Cyanamid. Garlan 3A herbicide is a water based formulation containing the triethylamine salt of triclopyr, and manufactured by Dow Elanco. These two products cannot be mixed at normal use rates without dilution by water. A typical tank mix of these two herbicides would contain 4 ounces of Plateau and 32 ounces of Garlon 3A. A direct mixture of these herbicides salt out quickly. The addition of nearly 50 ounces of water is required to keep these herbicides solubilized for extended periods of time. The addition of as little as 21 ounces of an adjuvant containing tallowamine ethoxylates and phosphate ester surfactants maintains the solubility of the herbicide mixture.

Detailed Description Text (7):

In Example 4, a dimethylamine salt of 2,4-D is formulate with phosphate ester block copolymer surfactants, a block copolymer derived from the sequential addition of ethylene oxide and propylene oxide to ethylenediamine, and other wetting agents. The resulting composition has a pH of about 5.0, as opposed to conventional dimethylamine salt of 2,4-D formulations which have a pH of about 8.5.

Detailed Description Paragraph Table (1):

	Ingredients % in formula
	Monoethanolamine salt of boric acid 80.0
<u>Tallowamine ethoxylate</u> surfactant 10.0	Phosphate ester surfactant 10.0

Detailed Description Paragraph Table (2):

	Ingredients % in formula
	Dimethylamine salt of 2,4-D 69.80 <u>Tallowamine</u>
<u>ethoxylate</u> surfactant 6.00	Phosphate ester surfactant 14.00 <u>Citric acid</u> 0.70 <u>Alcohol</u>
<u>ethoxylate</u> surfactant 2.00	Water 7.50

Detailed Description Paragraph Table (3):

	Ingredients % in formula
	Dimethylamine salt of 2,4-D 69.80 EO/PO Block
<u>Copolymer of Ethylenediamine</u> 5.00	Phosphate ester EO/PO Block <u>Copolymer</u> 5.00 <u>Alcohol</u>
<u>ethoxylate</u> surfactant 5.00	Water 15.20

Current US Original Classification (1):

504/206

Current US Cross Reference Classification (1):

504/232

Current US Cross Reference Classification (2):

504/323

Current US Cross Reference Classification (3):

504/365

CLAIMS:

5. The composition as claimed in claim 4, wherein the amine containing surfactant is a tallowamine ethoxylate and said composition has a final pH of less than about 7.

6. The composition as claimed in claim 5, wherein the agricultural chemical is a herbicide contains at least one of chemicals selected from the group consisting of dimethylamine (DMA) salt of 2,4-dichlorophenoxyacetic acid, DMA salt of dicamba, sodium salt of dicamba, isopropylamine (IPA) salt of glyphosate, IPA salt of 2,4-dichlorophenoxyacetic acid, sodium salt of acifluorfen, sodium salt of bentazon, sodium salt of imazethapyr, ammonium salt of imazaquin, IPA salt of imazapyr and sodium salt of asulam.

8. The composition as claimed in claim 1, wherein the amine containing surfactant is a tallowamine ethoxylate.

12. The composition as claimed in claim 11, wherein the herbicide contains at least

one of chemical selected from the group consisting of dimethylamine (DMA) salt of 2,4-dichlorophenoxyacetic acid, DMA salt of dicamba, sodium salt of dicamba, isopropylamine (IPA) salt of glyphosate, IPA salt of 2,4-dichlorophenoxyacetic acid, sodium salt of acifluorfen, sodium salt of bentazon, sodium salt of imazethapyr, ammonium salt of imazaquin, IPA salt of imazapyr and sodium salt of asulam.

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TITLE: Compositions containing surfactant and broadleaf foliar herbicide

Brief Summary Text (9):

The present invention provides, in one aspect, herbicidal compositions, comprising (a) a broadleaf foliar herbicide, and (b) a surface-active agent, comprising at least one ethoxylated C.sub.12-18 unsaturated fatty acid, ethoxylated C.sub.12-18 unsaturated fatty amine, ethoxylated C.sub.12-18 unsaturated fatty amide, or ethoxylated C.sub.12-18 unsaturated fatty alcohol, said surface-active agent containing an average of about 2 to 40 oxyethylene radicals per molecule, and preferably an average of about 5 to 10 oxyethylene radicals per molecule. In addition, the present invention provides a method for controlling broadleaf weed species, comprising the step of applying to said weeds a mixture comprising a suitable diluent, a broadleaf foliar herbicide and about 0.01 to 5 percent by volume of at least one condensate of about 2 to 40 moles ethylene oxide with one mole of a C.sub.12-18 unsaturated fatty acid, C.sub.12-18 unsaturated fatty amine, C.sub.12-18 unsaturated fatty amide, or C.sub.12-18 unsaturated fatty alcohol.

Brief Summary Text (11):

In the practice of the present invention, the broadleaf foliar herbicides which are used include classes of herbicidal compounds such as triazines, substituted ureas, phenoxy acids, sulfonanilides, and the like. Representative compounds include 5-acetamido-2,4-dimethyltrifluoromethanesulfonanilide (commonly known as "mefluidide"), 2-chloro-4-ethylamino-6-isopropyl-S-triazine (commercially available as "AATrex"), 3-isopropyl-1H-2-1,3-benzothiadiaz-4(3H)-one 2,2-dioxide (commercially available as "Basagran"), sodium 5-(2-chloro-4-(trifluoromethylphenoxy)-2-nitrobenzoate (commercially available as "Blazer"), 3-[p-(p-chlorophenoxy) phenyl]-1,1-dimethylurea (commercially available as "Tenoran"), 2,4-dichlorophenoxyacetic acid (commonly known as "2,4-D"), and 4-(2,4-dichlorophenoxy)butyric acid (commonly known as "2,4-DB"), as well as agriculturally acceptable salts of those compounds shown above as free acids.

Brief Summary Text (12):

The surface-active agents which are used in the present invention are certain ethoxylated unsaturated fatty acids, ethoxylated unsaturated fatty amines, ethoxylated unsaturated fatty amides, or ethoxylated unsaturated fatty alcohols. Ethoxylated unsaturated fatty acids are preferred, and ethoxylated oleates are especially preferred. Suitable unsaturated fatty acids include lauroleic acid, physeteric acid, myristoleic acid, palmitoleic acid, petroselinic acid, petroselaic acid, oleic acid, elaidic acid, vaccenic acid, ricinoleic acid, linoleic acid, linolelaidic acid, hiragonic acid, alpha or beta eleostearic acid, punicic acid, linolenic acid, elaidolinolenic acid, psuedoeleostearic acid, moroctic acid, alpha or beta parinaric acid, and mixtures thereof. Ethoxylated unsaturated fatty acids for use in this invention can also be prepared from saponified triglycerides of unsaturated fatty acids. Suitable triglycerides of unsaturated fatty acids include triolein, trielaidin, trilinolein, trilinolenin, ricinolein, and mixtures thereof, as well as the mixture of triglycerides obtained from castor oil. Suitable unsaturated fatty amines, amides, and alcohols include the corresponding amines, amides, and alcohols of the above-described unsaturated fatty acids (e.g., oleyl amine, oleyl amide, and oleyl alcohol).

Current US Original Classification (1):

504/222

Current US Cross Reference Classification (1):

504/231

Current US Cross Reference Classification (2):

504/321

Current US Cross Reference Classification (3):

504/323

Current US Cross Reference Classification (4):

504/332

Current US Cross Reference Classification (5):

504/333

Current US Cross Reference Classification (6):

504/363

Current US Cross Reference Classification (7):

504/365

CLAIMS:

1. Herbicidal compositions, comprising:

(a) a broadleaf foliar herbicide, and

(b) a surface-active agent, comprising at least one ethoxylated C.sub.12-18 unsaturated fatty acid, ethoxylated C.sub.12-18 unsaturated fatty amine, or ethoxylated C.sub.12-18 unsaturated fatty amide, said surface-active agent containing an average of about 2 to 40 oxyethylene radicals per molecule.

4. Herbicidal compositions according to claim 1, wherein said broadleaf foliar herbicide is 5-acetamido-2,4-dimethyltrifluoromethanesulfonanilide, 2-chloro-4-ethylamino-6-isopropyl-S-triazine, 3-isopropyl-1H-2-1,3-benzothiadiaz-4(3H)-one 2,2-dioxide, sodium 5-(2-chloro-4-(trifluoromethylphenoxy)-2-nitrobenzoate, 3-(p-(p-chlorophenoxy)phenyl)-1, 1-dimethylurea, 2,4-dichlorophenoxyacetic acid, 4-(2,4-dichlorophenoxy)butyric acid, or an agriculturally acceptable salt thereof.

13. A method according to claim 12, wherein said broadleaf foliar herbicide is 5-acetamido-2,4-dimethyltrifluoromethanesulfonanilide, 2-chloro-4-ethylamino-6-isopropyl-S-triazine, 3-isopropyl-1H-2-1,3-benzothiadiaz-4(3H)-one 2,2-dioxide, sodium 5-(2-chloro-4-(trifluoromethylphenoxy)-2-nitrobenzoate, 3-(p-(p-chlorophenoxy)phenyl)-1, 1-dimethylurea, 2,4-dichlorophenoxyacetic acid, 4-(2,4-dichlorophenoxy)butyric acid, or an agriculturally acceptable salt thereof.